**across & beyond**
**—A transmediale Reader**
**on Post-digital Practices,**
**Concepts, and Institutions**

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This collection of art and theory related to the annual transmediale festival in Berlin analyzes today's post-digital conditions for critical media practices —moving across and beyond the analog and the digital, the human and the nonhuman.

In keeping with the meaning of the prefix "trans" in the festival's name, the contributions also move across and beyond the field of media art, staking out new paths for understanding and working in the transversal territories between theory, technology, and art.

# Across and Beyond:
# Post-digital Practices, Concepts, and Institutions

**Ryan Bishop, Kristoffer Gansing, and Jussi Parikka**

> From the mouthpiece came a humming, the likes of which K. had never heard on the telephone before. It was as though the humming of countless childlike voices — but it wasn't humming either, it was singing, the singing of the most distant, of the most utterly distant, voices — as though a single, high-pitched yet strong voice had emerged out of this humming in some quite impossible way and now drummed against one's ears as if demanding to penetrate more deeply into something other than one's wretched hearing. K. listened without telephoning, with his left arm propped on the telephone stand he listened thus […] against the telephone he was defenseless.
> —Franz Kafka, *The Castle*[1]

Over the past ten years, the disciplines of media theory and media art and their institutions have been dramatically re-shaped in response to the ubiquity of digital technology and the emergence of the so-called digital native generation into artistic practice. Terms like "post-internet" and "post-digital" are associated with an artistic engagement with technology that is not necessarily preoccupied with the digital as such, but with life after and in the digital, working across old and new, digital and analog. Post-digital as an idea and a term has become a way to take account of, contextualize, and shift the coordinates of the debate.

At the same time, media and cultural theory have taken up the challenge of this post-digital world in which it has become impossible to separate the study of technological materiality from that of networked global capitalism and environmental changes on a planetary scale. For Kafka's protagonist, K, the new media reality of the signal humming on the telephone line leaves an acoustic trace, but without a meaning clearly deci-pherable to the human. As Bernhard Siegert points out, the telephonic meditations in *The Castle* are also commentaries on language and embodiment in the age of technical media: "Kafka moves the mythic origin of language (and of culture) from the anthropological domain to that of the nonhuman, where the distinctions between language and noise, animals and humans are abolished."[2] For the contemporary mindset, however, this sort of conflation of various regimes of reality is more likely to arrive in the form of Pokemon Go's augmented-reality hallucinations of the cityscape, or in the overwhelming ubiquity of other media platforms that crisscross contexts of work and leisure, as well as physical and digital space, in ways

that might leave a similar feeling of defenselessness and dis-empowerment as K experienced. Technical infrastructures are also the material structures where humans and nonhumans regularly meet.

By summoning critical concepts such as the post-digital, we are developing ways to grasp and intervene in this infrastructural formation of reality. The concept and the various positions surrounding it in fields of practice and theory gesture toward such potential, acknowledging that we are ineluctably embedded in the midst of such practices and infrastructures, even if not all appear or operate on the familiar anthropocentric scale.

This transmediale reader, published in conjunction with the thirty-year anniversary of transmediale festival, covers the response of media art and theory to these changes, more specifically drawing on media activism, media archaeology, critical media processes, and (post-)anthopocentric perspectives, offering various and complementary strategies for engaging these provocative contemporary concerns.[3] It outlines the case for the post-digital as a heuristic to understand the historical and material contexts of media art and culture, and offers both artistic and analytical ways to approach contemporary conditions. Just as the postmodern discussion staked out a temporal and intellectual position in relation to modernity without presuming to have necessarily superseded it, with the post-digital we intend such a temporal and critical distance from the digital, while remaining partly defined by it.[4]

The term is intimately related to transversal artistic practices that, until recently, would have been branded as media art, but that are now opening up to perspectives outside this institutionalized field, as the prefix "trans-" (meaning both "across" and "beyond") indicates. In her chapter on the "Technological Macrobiome" for this reader, Olga Goriunova suggests that transversality functions across an in-between materiality that emerges through the magnification of existing lines of practice. Such a perspective is valuable for approaching many of the recent and emerging practices of artists and designers who do not necessarily identify with the term "media art" and instead engage technology with methods informed by transversal ecologies and materialisms of the human and nonhuman.

Thus, this reader also reflects an ongoing shift within the artistic cultures surrounding a long-running media art festival such as transmediale. This shift has appeared for various reasons: on the one hand, the term "media" has itself become inflated, and so generic as to have been rendered almost superfluous.[5] Simultaneously, the scope of "media" in critical media studies has expanded widely to encompass various sorts of practices of knowledge and writing from Hindu-Arabic letters and numerals to calculus and card indexes. Architectural elements, such as doors, can count as media too, as can

the postal system.[6] Outside urban smart cities we can start to look at geological formations and materials such as mud or even thermocultures, as related to the ways in which media is built on top of and through existing planetary materialities and affordances.[7] It is no wonder that many arts and design practices are steering clear of identification with media as an industry, and toward processes of mediation that can be defined by other terms and critically engaged through less reified concepts.

At best, media arts is a placeholder waiting for specification. New materials have again entered the spaces of critical practice and making, and the studio has incorporated a new set of tools and technologies that have led some to cast themselves as laboratories. While the term is poached from the sciences, its use underscores the experimental and contingent elements of aesthetic exploration, as Jussi Parikka discusses in this volume. And outside the studio, artistic practices attach to urban and planetary infrastructures and other sorts of expanded sites of practice that acknowledge one more thing: the materiality of the digital is not reducible to the screen, not to software, and not even to hardware. It is a massively distributed reality that in turn conditions our perceptual realities.

The post-digital, then, provides sets of speculative strategies and poetics in an attempt to construct a complex architecture for thinking and creating within contemporary institutional, economic, environmental, and technological constraints and possibilities. These are contemporary concerns, but, as with all contemporary issues, they are shot through with conflicting temporal relationships not easily grafted onto the linearity of past, present, and future without seriously damaging understanding of the complexities involved. Instead, in this book they become concerns through which pasts reassert themselves and futures spill out. Parallel timelines emerge alongside fabulations and imaginaries. A speculative stance toward the future is complemented with speculations about the past. The multiple temporalities suggested in the "post" of post-digital show how transversality allows for alternative ways to undercut simplistic linear causality in narratives of technological and medial triumph or catastrophe. Kristoffer Gansing does just this in his essay by returning to the medial "vanishing point" of an early edition of transmediale.

The standard stories of technological development, progress, and determinism often foreclose imaginaries that post-digital interventions critique and overturn. The post-digital becomes a field for material but also imaginary, alternative practices that affect the sense of the contemporary. "When the future appears foreclosed," Paul K. Saint-Amour writes, "Anticipation loses its conditional relationship to that future: once seen as a fait accompli, a future event becomes a force

in the present, producing effects in advance of its arrival."[8] It is this kind of teleological foreclosure of knowledge and research that the resistance to streaming culture and economies offered by the speculative articles and artist contributions in this book seek to proleptically address.

Post-digital thinking and production serves as a kind of violence against chronological time and its various medial representations. Similarly, the deep time of geology renders ineffective the McLuhan-inflected anthropocentric formations of the time scales that media can occupy.[9] Besides a media-theoretical debate that links to contemporary art discussions about the Anthropocene era, such work produces a new way of looking at media not merely as a thing but as a process that itself affects its own conditions of existence: this allows alternative media cultural perspectives to emerge. The different temporalities (and indeed spaces) occupied by and produced through the analog in relation to the digital yield the kind of cryptic power of juxtaposition found in the collage techniques mobilized so often over the past century, especially in Western art and aesthetics in its global articulation. Techniques derived from earlier forms of collage can help us move beyond the rather antiquated obsession with digital and analog, and toward discussions that attach to technical media culture and the arts in new ways. Such complex material settings or assemblages do not fall in neat categories of digital or non-digital, and involve sets of agencies, institutions, infrastructures, operations, signs, and meanings across multiple scales of interaction.[10]

A critical outlook is paramount and operative in the works included in this volume. Such an outlook aims to not only challenge common assumptions about the influence of media and technology on everyday life, but also to invent cultural imaginaries for addressing and engaging technological transformation in ways that might propel us to use and devise media technologies differently. This volume offers a mix of newly generated contributions as well as projects and articles previously presented at transmediale festival in Berlin, which are newly opened up in reflective pieces concerning art practices, curation, and contemporary (post)digital culture. The festival has been a leading venue for presentations staging the conflicts of the post-digital, and this reader represents some of the internationally significant artists and writers who have participated over the years, with special attention to the past five editions.

The reader is not, however, a recap of the past years of the festival program, but a standalone volume that develops and pushes forward the curatorial ideas at the heart of transmediale in book format. It forges a different temporal relationship between these ideas and gives them a different way of traversing art, design, and academia. This feeds back to our

broader consideration of what an art and digital culture festival can be, and should be. The fact that the indefinite article "a," finds its place in the title of this volume (as opposed to the definite article "the") indicates a desire that it be a contribution to an ongoing discussion rather than a definitive statement. While it participates in discussions about the festival as a format and site of the post-digital, it also takes part in the wider discussions in art, media, and design about the kinds of practices we need to develop to begin understanding what sort of scales of operation we are dealing with in contemporary culture.

The post-anthropocentric is one response, but one that demands specification: if the human is not the center of action, then what is? Infrastructures, ecologies, processes? How is that elusive notion of the nonhuman to be situated in relation to media in the post-digital age? How can such contextualizing reveal the equally elusive notion of media? How might the post-digital offer new means of critically linking technology, culture, and nature? The collected contributions reinforce the case for the post-digital perspective outlined here, though the articles are not limited to explicitly theorizing (or even necessarily mentioning) the term post-digital. The underlying methodologies and critical thinking implied by this concept are in focus rather than the term's specific use and canonization. Nonetheless, we want to outline some concerns of the post-digital approaches taken in this volume that may serve as starting points.

## Concerns of the Post-digital

The methodologies and critical thinking implied by post-digital as a term are roughly sorted into the book's three sections: "Imaginaries," "Interventions," and "Ecologies." Each comes with a short section introduction followed by a mix of in-depth articles and artist contributions in a variety of formats. The three sections are informed by a need to discuss how the post-digital condition is concretely expressed on temporal, action-based, and systemic scales. The contributions take up the challenge to make tangible the ever-elusive relationships between technology, society, and culture, which we feel are accelerated in the post-digital to a point where nonhuman assemblages of technology and nature take on agencies of their own. Rather than repeating the doomsday scenarios of a technological world out of control or the next ecological catastrophe, or proclaiming the coming Singularity moment when humans and machines will finally liberate themselves from physical reality in some fevered Cartesian fantasy, the book's division along separate but intertwining themes reflects the complexity of post-digital contingencies. Instead of a naive

attempt to predict "what's next" or "the next big thing," the term is itself an attachment to the continuation and revision of earlier types of cultural production and discourse in ways that post-communism, post-feminism and postcolonialism signaled as well.[11] It allows us to understand the material complexities of digital culture beyond the clichés of zeroes and ones, including the material instantiations of devices, which might be partly controlled by informational processes but are irreducible to a phantasm of an immaterial reality of data. Instead, seemingly obsolete practices reemerge like zine culture and analog printing techniques, as Alessandro Ludovico writes about in his essay for the "Imaginaries" section and the digital itself is being questioned in new, critical ways, even in mainstream culture.[12]

## Imaginaries

The current questioning of the digital and appropriation of "old" techno-cultural practices signal a new hybridization of artistic production, which Florian Cramer so well described in his 2014 text "What is 'Post-digital?'" He writes:

> "Post-digital" is arguably more than just a sloppy descriptor for a contemporary (and possibly nostalgic) cultural trend. It is an objective fact that the age in which we now live is *not* a post-digital age, neither in terms of technological developments with no end in sight to the trend towards further digitization and computerization nor from a historico-philosophical perspective.[13]

As previously mentioned, post-digital seems to shift the coordinates of debates surrounding technological culture to a more fluid sense of past and future, now and then, material and immaterial. However, as Cramer also indicates in that essay and in his contribution to this book, it is in danger of becoming just another name for a period that sets a temporal coordinate system in place, as has happened with terms like postmodern, which is counter to the general impulse behind the term's invention.[14] In order to avoid this reduction, a useful perspective is that of the imaginary, in which the post-digital challenges consensual models of reality and techno-rationalist discourse. For instance, in this section artist group YoHa explore the "gray media" of daily life, that is, "technical objects that can be thought of as marginal and recessive" the often boring or seemingly banal background objects in which the artists find imaginative potential.[15]

The idea of the imaginary strongly resonates with another key field of the past years, media archaeology. Both share a vibrant interest in the practice-theory continuum, and both aim

to develop critical insights that work through alternative imaginaries of time; as opposed to a sanitized linear sense of media cultural progress. Media archaeology has offered this by way of case studies and by way of methodologies that reach out to media culture as a cyclical, micro-temporal, or even deep-temporal regime of cultural production.[16] Baruch Gottlieb and Dmytri Kleiner, part of the artist group Telekommunisten, describe a project from their *Miscommunication Technologies* series that reimagines pneumatic mail system technology and becomes a relational machine of sorts. And, following up on her performance *The Collapse of PAL*, in her contribution Rosa Menkman similarly reflects on what is lost in translation when one relational machine is phased out by another, "newer" media.

Considering media history and contemporary culture in a recursive relationship opens a similar agenda and a conversation between media theory and post-digital practices. Reading the past changes how we see the present, and an analysis of the present changes how we understand the past.[17] With his contribution, Dieter Daniels retraces the history and continual historicization of media art, discussing both the field's initial phase of institutionalization and later phase of crisis in the context of the post-digital. This resonates with a focus on shifting terminology, as media art is increasingly replaced with the concept of "art & tech": for her contribution, Olia Lialina hones in on the use of words like "technology" that are often taken for granted to describe our contemporary condition, but whose meaning has in fact shifted and been instrumentalized over time. Such a task is not merely about hermeneutics of interpretation but about how we actually deal with the material world around us and how the material world itself radically alters fundamental questions about the human in contexts of affect and non-conscious cognition.

## Interventions

Media historical themes become part and parcel of how we negotiate the contemporary. In other words, they become involved in a political recalibration that functions both as an analytical focus and an affective mood that necessitates more than contemplation, interpretation, or analysis. Much of the legacy of critical cultural studies and feminist studies is present in positions that see theory as practice, and practice as a situated form of intervention; Cornelia Sollfrank provides a detailed historical overview of how cyberfeminists approached practice-as-intervention. As many artist-activists testify through their own work, taking action is becoming ever more urgent at the same time as it is faced by seemingly insurmountable obstacles. Such aporias seem central to much post-digital artistic produc-

tion. In this volume alone, some of the featured artistic works, such as Geraldine Juárez's *Hello Bitcoin* or Julian Oliver and Danja Vasiliev's *PRISM* (in the text "Quarantined"), provide a startling range of calls to (in-)action prompted by the intersection of technological and geopolitical conditions and the unavoidable resistance they demand. Further, part of the legacy of the Snowden leaks has been its implications for network politics, media activism, and interventions. As Clemens Apprich and Ned Rossiter write in their contribution in this book: "Post-Snowden, one senses a much broader general suspicion, if not informed critique, of digital communication infrastructures as technologies of capture, which distinguish themselves not so much through their unique selling proposition as through their insignificance." Indeed, one can easily observe the critical awareness of politics of the networks and their infrastructures that has penetrated mainstream publicity as well as user practices. See Daphne Dragona in this volume for a reflection on the subversive potential of artists engaging with new network politics.

Users are increasingly aware and involved in the systems they use such as changing DNS settings, using VPN connections, installing TOR, and, in certain communities, taking part in cryptoparties to educate each other about the ways in which the leaky computer can be somewhat controlled. This type of awareness has, however, emerged alongside a broader awareness of the insufficiency of existing political tactics of resistance, which are often coded or anticipated by the system that was the issue in the first place. Such co-option of technological potential is what leads Tiziana Terranova to propose "the construction of a machinic infrastructure of the common" in her essay for this book. Hence, both in terms of technological platforms and solutions and in terms of inventing new methods of political resistance, we can speak of the need for post-digital interventions as the "art of insubordination," to use Geoffroy de Lagasnerie's phrase from his text on the topic. New political figures such as Edward Snowden, Julian Assange, and Chelsea Manning have had a massive impact in shifting the focus of the debate and exposing mechanisms of violence in so-called liberal democracies. Not merely a personification of political questions, these actors become metonymic of what counts as the political, and questions of infrastructure become ways to address the asymmetry inherent in internet politics. It should remain a leading task to reveal and disrupt the systemic nature of how organizations and institutions express forms of power, and in this section Tatiana Bazzichelli offers an important self-reflection by examining the boundaries of the media art festival itself as an institution and discussing its relations to the networks around it. Examining systems is especially important when dealing with digital forms of soft

power that depend on calculative and predictive regimes, which present themselves as "natural" and self-evident. Erica Scourti creates a necessary friction against these regimes with her poetic intervention into the language of prediction, titled "Think You Know Me."

## Ecologies

The real becoming-natural of technology takes place on a basic level of physical and human resources, as explored in one of the artistic works previously featured at the festival and documented in this book. In his essayistic film, *Lettres au Voyant*, Louis Henderson travels to Ghana's technological-waste repositories in a reenactment of travelogues of the colonial era, their search for riches and adventure now juxtaposed with environmental devastation, rendering visible the invisible ends of supply chains of medial development. Given the seeming naturalization of the digital and its intertwinement with geopolitics and new regimes of resource extraction and geo-engineering with impacts of planetary scale, the work on the emergent, messy ecologies of information, on the human and the nonhuman, as well as on technological infrastructure has gained much currency in the past years. Zooming in on one aspect of these new ecologies, Benjamin H. Bratton explores human-bot interactions in his text for this section. From a different angle, Ryan Bishop delves into questions of human and nonhuman cognition in his text on remote sensing systems, seeking to locate the political subject within this new landscape.

Accordingly, another phrase for the post-digital is voiced as "critical infrastructure," which was also taken up as a title of a project by Jamie Allen and David Gauthier, an artistic research and production residency in which they "speculated what it might be to look 'down,' into, and through the sediments of a technological present." Apprich and Rossiter provide a theoretical framework for projects that orient themselves around the term. "Infrastructures are critical because they are always-already in crisis," they write in their contribution.[18] The fact that infrastructure is what ensures that our end-user experience stays intact as smooth and harmonious may not be much of a surprise to anyone even remotely familiar with the longer legacy of infrastructure studies, but the ways in which artistic and design practices and contemporary network theory are refocusing on the topic is itself worth noting. Making infrastructure critical becomes a gesture of rescaling attention to such sites and to the processes where scales meet. It also places attention on human operators, technological systems, the imposing force of standards, and other gray media that take agency when platforms become distributed sites for

the user. Thus, new concepts and terms partially technical, partially political emerge in the vocabulary of governance.[19]

As another approach to infrastructural analysis, Keller Easterling calls for a consideration of infrastructure's *disposition* rather than solely its mechanisms and effects, in order to understand the tendencies and affects behind it. Going beyond mere analysis of the imperial forces of infrastructure operative in contemporary digital culture, the various contributions to this volume offer theory- and practice-based ways to engage with this multiscalar reality. From the invisibility of the boring technologies that structure the flow of everyday life in YoHa's project *Evil Media* to the proclamation of an accelerated era of "Additivist" technological practices in Daniel Rourke and Morehshin Allahyari's *3D Additivist Manifesto,* this reader, just like transmediale itself, revels in the ambiguity of the post-digital while trying to promote critical understandings of it. This ecology is not mere background but an active part of making and being made a dynamic reality that works both as natural and unnatural: made of nature and its constant technological modulation. transmediale festival works, then, as a situated episodic structure that stages various ways to understand and intervene in this ecology.

## Sites and Futures of the Post-digital

In this reader, evolving perspectives of the above-mentioned themes as well as others are taken up from a number of different critical angles and modes of examination. The chapters discuss current predicaments of media art and critical net culture, and their relations to research, the art world, and civil society. In the spirit of *Gegenöffentlichkeit,* or counter-public, in which transmediale was founded at the end of the 1980s, we also want to demonstrate how transdisciplinary artists, researchers and technology activists can foster much-needed post-digital media literacy. This task is very much tied to an evaluation of the manifold institutional situations in which the post-digital takes place. Over the years, the transmediale festival has attempted to curate ideas and practices useful over a sustained period of time, rejecting the clichéd view that media technological change has been (and continues to be) too rapid for us to understand. Such a long-term perspective avoids the often recurring reductive approach taken to digital culture in mainstream cultural debates. By curating its cultural program along the lines of long-term engagement, transmediale attempts to cultivate artistic work in a politically significant and critical way. In the process, the festival has become an important long-running international platform for exchanges between artistic and academic research on technological development and their entry into wider public domains.

The context of transmediale as a festival of and in media technological culture has, however, fundamentally changed over the years. This change, of course, applies to all cultural institutions, from museums and galleries to archives, libraries, and universities, as all have faced new situations with digital technologies entering their walls, organizational structures, and activities. Besides a technological change in how we think of accessibility of archival storage and display, their logistical placement and movement, and their status as objects of cultural heritage, these changes have to be read against the backdrop of the past decades of austerity politics that have hit national public sectors particularly hard. A shift from the public function of cultural institutions to their infiltration by private infrastructures and platforms (such as the Google Cultural Institute, or, on a smaller scale, the outsourcing of institutional communication, resource management, and other systems to private providers) is the other end of the political economic transformation that also falls under the cultural marker of the post-digital. Treating cultural institutions as data institutions is an important, perhaps necessary, approach, but so is treating data as embedded in situations of asymmetrical power relations and complex political economies.[20] The post-digital examination of the fraught nexus of cultural and academic institutions in relation to state and non-state policies and actors demands explorations of transversal gaps as sites of potential change, recalibration, and critical reflection.

Concurrent with the emergence of the digital and post-digital, as well as the solidification of neoliberal political economies, has been the rapid increase in programs and labs committed to collaborative experimentation in art and technology. The current prominence of art and technology labs in the context of the resurgence of collaborative practice in the arts involves not only those of artists, but also a wide range of cross-disciplinary groupings of designers, scientists, engineers, scholars, and others. The push for collaboration in the arts is part of a reevaluation of the meaning of "research" as it is understood by arts practitioners, given their expanded engagement in a range of contexts beyond galleries and museums and into, among other places, universities, businesses, and science and tech labs. At the same time, the massive growth of the tech sector has given rise to a new generation of speculative research enterprises, from Google to SpaceX, which share the expansive research and development (R&D) horizons of advanced art.

As these collaborative practices become identified as productive and profitable in a time of reduced budgets, savvy museums, galleries, companies, and universities see an opportunity. The convergence of entrepreneurial precarity and a marginalized

avant-garde are pulled together in the new labs, many of which are made possible by the explosion in digital experimentation and also the discourse of the digital innovation economy. Concurrently, of course, the media technologies celebrated by Stewart Brand and other pioneering figures of counterculture emerged largely out of military R&D. One can justifiably claim that there is a convergence in the early twenty-first century of Cold War alliances with slightly modified actors and agents. Grasping the repetitions and variations of historical trajectories directs us to the "post" in post-digital, in order to examine the rollback of the possibility for alternative, not to mention radical, politics in the contemporary moment. The chance for real research separate from monetization or weaponization becomes increasingly elusive. The teleological drive of the scientific method under the guises of "problem-solving" and "unintended discovery" often thwarts the radical collectivity from realizing its aesthetic, political, or sociopedagogical goals. And where can the "politically possible" reside when avant-garde "disruption" has become the clichéd mantra of universities, entrepreneurs, and the military? What sort of alternative institutional forms can carry over the earlier critical and ethically productive functions of public institutions? Such challenges delineate post-digital artistic production and theorization, informing the critical direction of this volume and the ongoing project(s) of transmediale and its research collaborations.

1  Franz Kafka, *The Castle*, trans. Mark Harman (New York: Schocken Books, 1998 [1926]).
2  Bernhard Siegert, *Cultural Techniques: Grids, Filters, Doors, and Other Articulations of the Real*, trans. Geoffrey Winthrop-Young (New York: Fordham University Press, 2015), 28.
3  The term "post-digital" first played an important part at transmediale in 2013 with the instigation of a "Post-digital Publishing" workshop by Alessandro Ludovico, Florian Cramer, and Simon Worthington, inspired by Alessandro Ludovico's book *Post-digital Print: The Mutation of Publishing since 1894* (Eindhoven: Onomatopee, 2011). Since then, its use has been broadened far beyond the context of print and publishing, but transmediale's approach still shares the original premise of the workshop (and book that preceded it). Just as Ludovico's book invited readers to reflect on the significance of print at its point of transformation—or even supposed disappearance—into the digital, this anthology attempts to offer post-digital perspectives on various aspects of media culture in transition.
4  See Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (2014) http://www.aprja.net/?p=1318.
5  See Siegfried Zielinski, *[…After the Media]*, trans. Gloria Custance (Minneapolis: Univocal, 2013).
6  Bernhard Siegert, *Cultural Techniques*, 7–10.
7  Jussi Parikka, *A Geology of Media* (Minneapolis: University of Minnesota Press, 2015). Nicole Starosielski, "The Thermocultures of Geological Media," *Cultural Politics* 12:3 (forthcoming November 2016). Shannon Mattern, "Of Mud, Media, and the Metropolis: Aggregating Histories of Writing and Urbanization," *Cultural Politics* 12:3 (forthcoming November 2016).
8  Paul Saint-Amour, *Tense Future: Modernism, Total War, Encylopedic Form* (Oxford: Oxford University Press, 2015), 12–13.
9  See Parikka, *A Geology of Media*; see also Siegfried Zielinski, *Deep Time of the Media*, trans. Gloria Custance (Cambridge, MA: MIT Press, 2006).
10 This stance echoes writings such as Matthew Fuller, *Media Ecologies: Materialist Energies in Art and Technoculture* (Cambridge, MA: MIT Press, 2005).
11 Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (2014) http://www.aprja.net/?p=1318.
12 Ibid.
13 Cramer, "What Is 'Post-digital'?"
14 Geoff Cox, "The Post-digital and the Problem of Temporality," in *Postdigital Aesthetics: Art Computation, and Design*, eds. David M. Berry and Michael Dieter (Basingstoke: Palgrave, 2015), 151–162.
15 YoHa's project from transmediale 2013 built further on the notion of "evil media" as developed in Matthew Fuller and Andrew Goffey, *Evil Media* (Cambridge, MA: MIT Press, 2012).

16 For an overview, see *Media Archaeology: Approaches, Applications and Implications*, eds. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011). See also Thomas Elsaesser, *Film History as Media Archaeology* (Amsterdam: Amsterdam University Press, 2016).
17 Geoffrey Winthrop-Young, "Siren Recursions," in *Kittler Now: Current Perspectives in Kittler Studies*, eds. Stephen Sale and Laura Salisbury (Cambridge: Polity, 2015), 91.
18 See also Alessandra Renzi and Greg Elmer, *Infrastructure Critical: Sacrifice at Toronto's G8/G20 Summit* (Winnipeg: Arbeiter Ring Publishing, 2012).
19 See Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press 2016).
20 The Internet of Cultural Things-project (AHRC award number AH/M010015/1) has been developing approaches to address the library as a post-digital computational system that is comprised of its infrastructure and flows of data: https://internetofculturalthings.com. Through the artistic intervention of Richard Wright as an artist in residence at the British Library, the project has developed new methods for a situated, institution-specific approach to cultural data.

## A. Imaginaries

Projecting media archaeological and genealogical insights into the present and future, this section begins by asking speculative, historical, and yet constantly contemporary questions: what are media, when are media, and how do they mediate the production of reality? What is the relationship between speculation and design? Can alternative realities really be conjured into being — or is imagination itself a product of cultural, historical, and medialogical context? Is functionality the right vocabulary to use when speaking of imagination at all? Through intersecting narratives from literature, art, design, philosophy, and beyond, this section highlights the importance of fiction, with the belief that fictions don't exist in a vacuum — they have the potential to produce necessary friction with their environments.

In Lacanian psychoanalysis, the imaginary deals with the process of negotiating identity between the symbolic and the real. In the context of philosophy and activism, Cornelius Castoriadis positioned the "radical imaginary" as an agent of social change. When applied to media, the imaginary can stand for a kind of mental modeling: the way subjects try to comprehend the elusive aspects of media under a unified set of definitions. In recent media art and theory, the imaginary is perhaps most present in strands of media archaeology, where the past workings of technology are unearthed and cracked open for contemporary interpretation. The overarching theoretical framework of the post-digital, however, aims to collapse past-present distinctions through expanding them, and this requires rigorous imaginative labor.

In response to these and other historical strands, the contributions to this section interrogate the powerful implications of naming and terminology across fields and institutions. One must pin things down in order to imagine how they can change — but this has to be tempered by an understanding of the inherent limits of any categorization; otherwise one risks creating yet another reducible entity for systems of power to appropriate. With this in mind, this section pursues the tension between imagination and its instrumentalization, the conceptual and the material.

# Kristoffer Gansing
# 1995: The Year the Future Began, or Multi-media as the Vanishing Point of the Net

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> The Revolution of digital media has only just begun, CDs as data carriers, hundreds of TV channels, interactive information networks with sound and image—the mediascape is definitely becoming more complex and versatile. The demand for digitally created images and image sequences is rising. Are you prepared?
> — "Neuland," advertisement for a German AV company in the catalogue of VideoFest '95.[1]

> 95 was the year of the fall of Techno and the rise of the Computernetworks. "Internet Kills the Raving Star."
> —Geert Lovink and Pit Schultz[2]

On a rather dubious mission to mark 1995 as the most influential year in recent times, in 2015 the author W. Joseph Campbell launched his book *1995: The Year the Future Began*, citing five "epochal" events. These were the mainstreaming of the internet (referring to the popularization of the www, with the browser Netscape joining the stock market and the launch of Microsoft's multimedia operating system, Windows 95), the O. J. Simpson trial, the Oklahoma City Bombing, the Lewinsky Affair, and the Dayton Agreement peace treaty.[3] According to Campbell, these "events" together mark watershed "developments, in new media, domestic terrorism, crime and justice, international diplomacy, and political scandal."[4] There are several problems with this thesis, not least its conflation of longer running technological and political processes, such as the development of networked communication or the Balkan conflicts, into year-defining "events," and the US-centric idea of an emerging future determined by Northern American domestic and foreign policy (however influential). Yet admittedly there is also something convenient about considering 1995 as a defining point in time for our post-digital condition, not so much because of the continuities with the present age that it proposes (such as the importance of the internet and the emerg-

ing mainstreaming of digital culture), but for the conflicts and contradictions within digitization that started to appear more fully in that year.

## POST-DIGITAL VANISHING POINTS

Inspired by the idea of the medial "vanishing point" as described by Siegfried Zielinski in his study of the parallel histories of cinema and television, titled *Audiovisions,* I will here consider the different sociotechnical imaginaries opened up by analyzing 1995 from the point of view of the transmediale festival.[5] Although not overtly theorized by Zielinski, the vanishing point as applied throughout *Audiovisions* becomes a perspective from which to look at the history of cinema and television through their delineation by specific "technical, cultural, and social processes."[6] These processes for Zielinski are, in the case of cinema, related to industrialization in which cinema becomes both a sedation and orientation point in the rush of progress, and, in the case of television, to a post-war demand for an individualized media consumption realized as a mix of mass mediation and living-room intimacy. In his book, Zielinski discusses how these media forms marked vanishing points of large-scale social processes in the way that they were necessary responses to new living conditions. Thus when he, as an unconventional media historian, speaks of the end of cinema or television (or indeed of the concept of media in general), he is not referring to definite ends but to the final stages or transition points of certain time periods contingent with, and therefore delimited by, large-scale social changes such as industrialism. Similarly, when speaking of the notion of the post-digital today, it is not for me a term that denotes the end of the digital, but rather a term that describes how a certain historic mobilization of the digital both as ideal and material has become subsumed in larger socioeconomic and global development schemes, where everything, to some extent, is already digital (and even analog entities are bound up with digital information flows).

The vanishing point of all media might therefore seem to be the totalizing moment of the digital, but it is precisely at this point where the distancing operation of the post-digital

concept can open up readings that explore how a medium is always many different things at different points in its history. No history can be written from the totalizing perspective that any specific medium was always tied to a specific development. Instead, I will attempt a transversal analysis by touching down at a specific point in the history of transmediale, which becomes a vanishing point of media art history, able to inspire new modes of thinking and acting in media.

## BACK TO THE FUTURE

Returning to 1995 with a more nuanced perspective than that of Campbell, that year also marks a point in time that is very much defined by what Wendy M. Grossman called the "net. wars" in her 1997 book of the same name, which chronicled different struggles between control and freedom in the early days of (inter-)networked mass communication (concentrating on the early to mid-1990s). In those years, many of the digital culture debates that are taking place today on a global scale and in the wider public sphere, through mainstream politics and media outlets, were just being established. These concerned, for example, intellectual property, privacy, data collection, and online social behavior. Such topics were initially discussed mostly within a Euro-American discourse, with a bias toward the US euphoria about the endless transgressive possibilities of our virtual lives in cyberspace, as well as the promises of global entrepreneurial freedom on what the Clinton/Gore administration famously referred to as the "information superhighway."

It would be all too easy, however, to present the 1990s as the years of digital euphoria and the dot-com bust that followed as a shift from utopia to dystopia. More reflective and critical voices on the topic were certainly also there in the mid 1990s, and the most exciting of these were not of a cultural-pessimist kind but came mainly from within an emerging "critical net culture," for which 1995 was also a watershed year. It was in this year that Richard Barbrook and Andy Cameron published their famous critique of the *Wired* magazine–influenced discourse on digital culture, "The Californian Ideology," which linked the merging of American counter-culture and neolib-

eralism to the new digital bohemia of the west coast.7 In a related spirit of anti-Wired-hype, Geert Lovink and Pit Schultz founded the seminal mailing list "nettime," for "net criticism, collaborative text filtering and cultural politics of the nets."8

## VIDEOKULTUR GOES MULTIMEDIA

Initially, transmediale was formed in 1987 as a video art festival organized by the Berlin video collective Medienoperative, an offshoot of the Berlin Film Festival's "Forum" section for young cinema. The first proper festival was held in 1988 under the name VideoFilmFestival, still in cooperation with the Forum, but for the first time also featuring an independently produced and curated program. From the very beginning, its makers understood the festival's unique role in providing a space between established film genres and modes of production, and also opened up the narrow focus of film festivals to also include art and new media work that did not necessarily take place in the cinema. On one hand, VideoFest (so named in 1989) wanted to be an agent provocateur, presenting new types of art practice through media. On the other hand, it aimed to cast these new practices in a realistic light, not succumbing to technological hype but staying open to the possibilities of technological change while critically discussing its pros and cons with regard to artistic production.9

By the early 2000s, transmediale had become a natural meeting point for these discussions (under the leadership of its second artistic director, Andreas Broeckmann), but in 1995 VideoFest only cautiously embraced European critical net culture. For a festival still mainly rooted in independent and artistic *Videokultur* but with ambitions to expand to a wider inclusion of new media, the 1995 edition must have presented the organizers with some dilemmas—at least this is the impression one gets when reviewing the program, which contains a number of interesting contradictions. In 1994 VideoFest was among the first to feature the pioneering German net art project *Handshake* by Karl-Heinz-Jeron and Michel Blank.10 Named after a communication protocol, the approach of this artwork was typical of the time, as it foregrounded the infra-

structure and act of networked communication rather than its representational content and formal aesthetics. Maybe this is why, in 1995, as the early hype about the internet and the web was reaching its peak, VideoFest chose to almost reverse its approach to the internet, offering only one out of four installed exhibition computers with an internet connection, keeping the rest offline. According to the catalogue statement explaining this decision, networked communication was seen as incompatible with an in-depth experience of art: "the emphasis of this year's VideoFest is on exhibiting exciting works (like paintings in a gallery); we already offered you opportunities to explore the net and to surf in it last year."11

While one of the focus points of the 1995 festival was "multimedia," divided into CD-ROM–based and internet-based works, the open-ended character of the use of the latter medium was apparently subordinated to an idea of a museum-like reception. The irony was that the offline form of presentation ended up being even less museum- or gallery-like, as it foregrounded an individual rather than a collective reception of the artwork (which at least is manifested in an online presentation). This idea of multimedia was arguably informed mainly by home computer, specifically gaming culture, as that was likely to have been the most common point of contact with digital interactive environments for the general audience at the time (as well as for the curators and artists). In his introduction to a panel on Multimedia, Micky Kwella, the artistic director of the VideoFest, reinforced this thesis by somewhat negatively stating that the new medium was dominated by games and porn and that the mission of the VideoFest focus on multimedia was to provide a grounded counterpoint to the hype, to show the artistic limitations as well as possibilities of multimedia and internet art.12

## "REACTIONARY PIGS!"

There was, in other words, an anti-consumerist streak in the approach to multimedia, which was arguably characteristic of VideoFest as a whole regarding alternative media culture. In 1994, the festival organizers sent out a questionnaire to

the artist-run mailing list "luxlogis" with a series of questions on "electronic culture," asking recipients if and how various aspects of electronic media could actually *be* culture, including television and video as well as multimedia. This approach was violently rejected by the Dutch media theorist and activist Geert Lovink, who accused the VideoFest of trying to apply a German brand of cultural conservatism to an open culture of experimenting between media forms.

✉ From: Geert Lovink

Subject: Re: HANDSHAKE — VideoFest94, Berlin
To: luxlogis@uropax.contrib.de (Lux Logis e.V.)
Date: Wed, 2 Feb 1994 08:04:21 +0100 (MET)

Is Handshake culture....?!? Is Berlin Culture.....!?
Don't spread German self-hate towards media!
Attack all expressions of media-ecology
It is depressing to read as the very first question on your list whether television is "culture." Television is a technology, a medium as you wish. Allthough in decline as a one-way, two channel massmedium with huge influence on the population, it's slowly growing in other directions. People and groups can influence the direction of their own television culture, by starting experiments, doing piracy, working on the connection between television, telephone and computer, by commenting the current narrow ideas of interactivity. And by making television themselves. And not starting to debate such silly topics, dictated by some elitist frustrated German intellectuals who don't know anything about the media or new technologies and who want to go back to the real world, opera, nature etc. You reactionary pigs![13]

This aggressive reaction from Lovink points us to possible contradictions within shifting "electronic culture" as video festivals tried to adapt their cultural classification systems while activists and artists were already thinking beyond ideas of genres of cultures informed by the networked media environment. The VideoFest approach, however, was probably not

an expression of cultural conservatism as Lovink here assumes, but rather followed the spirit of *Gegenöffentlichkeit*, in which the main concern is to create other forms of (often grassroots) participation in culture rather than through commercial or high culture.[14] If the festival's idea of *Videokultur* was very much defined as an artistic counter-position to mainstream cinema and television, then the initial VideoFest approach to art in emerging digital culture seems formed in dialogue with the commercial game and home computing culture, while only cautiously embracing open-ended flow of communication online.[15] This is evident in the 1995 catalogue foreword by Kwella, which states that in the 1970s multimedia meant "an integration of different arts in a live performance," but has now migrated to an isolated setting of "A sits in front of the computer, immersed in a CD-ROM or surfing through the INTERNET," where all media forms are still mixed, albeit without the live performance element and "loaded into the computer at home and used right there."[16] This decentralization of access to art by its entering into a digital communication space was seen as positive by the festival, while the commercial use of multimedia was to be "treated as a topic inviting critical discussion."[17] The open, constant flow of information was an element of distraction rather than of empowerment.

CD-ROMS AFTER SNOWDEN

With historical hindsight we now know that CD-ROM art and internet art (in its early net.art form) never became established art genres in the way that the VideoFest makers might have hoped for. The formats quickly lost ground to processes of technological obsolescence and the simultaneous expansion and commodification of the social uses of the www (read Web 2.0 and the subsequent dominance of Silicon Valley–developed platforms). When seen from the point of view of linear media history, the web was to be the vanishing point for the relatively short-lived idea of multimedia as based on the offline single-viewer experience at home. This development is similar to how 1970s utopian visions about the self-empowering possibilities of television and video gradually gave way to a standardi-

zation of production and distribution based on commercial models.[18] However, just as there are legacies of experimental and alternative video practices that continue to be rich sources of inspiration for artists today, there are aspects of multimedia practices of the 1990s that are ripe for rediscovery. Recent reappraisals of CD-ROM art have highlighted their unconventional approaches to narrative, graphic, and interface design, their intimate distribution models, and their importance for the development of both internet-based art forms and the independent games movement.[19] In 2015, when the digital culture journalist Marie Lechner asked artists and theorists involved in CD-ROMs what made this art form specific, Antoine Schmitt highlighted that CD-ROM art "opened a questioning on the active relationships between humans and their environment in general."[20] Seemingly contradictorily, Geert Lovink maintained that the most significant features of early home multimedia is that it was indeed happening mostly offline and that therefore CD-ROMs were "NOT social."[21] At the same time, these aspects of CD-ROM art's opening up and existing offline could be seen to work effectively together, as the "active relationship" Schmitt referred to was, in this case, not foreclosed by the corporate web with its streaming and data-mining models. Instead, it held the potential for a speculative approach, where, according to artist Suzanne Treister, "user generated content was in the mind of the viewer, for them to take away with them, rather than input back into the work."[22]

In the current streaming model of cultural content, this (non-)contradiction, of course, makes CD-ROMs seem more than archaic and also vehemently noncommercial. If we look to the game business as that which has carried the cinematic interactive experiences often found on CD-ROMs further, the main trend for years has been toward online multiplayer games. The offline single-player game is not only becoming near extinct in the mainstream, but also increasingly stigmatized as an anti-social form. From a critical post-digital perspective, the single viewing and offline experience is actually where CD-ROMs are relevant as a cultural form that goes against the norm of always being online, with its implications of database structures ready for commercially motivated mining and surveillance.

The relevance of going at least partially offline has been demonstrated by the post-Snowden activists and artists, who revisit analog forms of communication as well as hybrid and mesh networking projects to create local infrastructures of exchange, in order to restrict communication to local or translocal communities.[23] Furthermore, the so called "notgames" movement of exploratory games such as *Gone Home* (2013–16) or *Dear Esther* (2012), and the interactive fiction put out by the DIY community surrounding the open-source tool, Twine, are examples of how the experimental approach to multimedia in the 1990s is being taken up by new generations. The way that VideoFest 95 championed offline and CD-ROM-based multimedia then only becomes ridiculous from a perspective of linear media history, where those forms became obsolete in the wake of the "total" web. If we turn this view around, we can see that the web is not the vanishing point of multimedia, but that multimedia can be seen as a vanishing point of what net culture *could* have been: anti-consumerist, playfully user-unfriendly, selectively online, and a vehicle for thought-provoking forms of narrative and interaction. The 1995 multimedia infrastructure, then, with its intermittent net access, downloading just what it needed as an internetworked "thing," shows us the vanishing point of today's total access and user transparency—and thus constitutes an alternate deep web of the recent history of digital culture.

TECHNO-SOCIAL IMAGINARIES
AND TRANSMEDIALE

Media and technological change are notoriously elusive objects of study. Media research, as well as artistic media practice, seem cursed to be constantly moving on to the next thing. "All media are partly real and partly imagined," as Eric Kluitenberg has asserted, riffing on Benedict Anderson's influential concept of "imagined communities," indicating that the notion of the imaginary can help us to come to terms with the elusiveness of media and better understand how the sociocultural meets the technical.[24] As I've argued elsewhere, the imaginary is a tool for transversal and archaeological media analysis that allows

us to capture a certain sense of the limits of a medium, and at the same time to picture how it could be different.[25] Due to their operation at the intersection of art, society, science, and technology, festivals such as Ars Electronica, Future Everything, and transmediale feature strong imaginaries of what media are, and what they can and will do in the future. In the previous section, I explained how a specific medial situation related to transmediale history can also serve as the starting point for outlining alternatives to present medial configurations. The historical context of 1995 was that of a "vanishing point," in the sense that it marked a transition moment where the mediascape was taking on a new configuration: as the name shift from VideoFest to transmediale during the second half of the 1990s indicates, convergent media forms eventually became the norm rather than the exception, leading us not only to the convergent but to the elusive character of media in digital society. Paradoxically, it is only in the post-digital condition that we may now perform a less linear reading of these developments, reinterpreting 1995 as a vanishing point, since both our analog and digital infrastructures have been revealed to be inescapably intertwined on global, geopolitical, and geophysical levels.

## POST-DIGITALITY, OR THE BECOMING-ISLAND OF MEDIA

Between the media of video and television, there exists a long-established dialectic of the individual and the mass, of participation and passivity, of emancipation and submission, of the DIY amateur and the high-tech professional. Could it be that the multimedia home PC and the internet have held a similar, if widely unacknowledged cultural dialectic?[26] Over the years, video art has been heralded as a DIY and participatory medium for personal and intimate expression, which stands in opposition to the professionalized production and mass consumption of television. In contrast to this, digital networks imply a reverse situation, where the harnessing of user content—what, in the television age, might have been akin to home videos ridiculed on shows like *America's Funniest Home Videos*—has become central. As I mentioned above,

and as Clemens Apprich and Ned Rossiter assert elsewhere in this volume, participation and connection have become compulsive to the extent that going offline is now a privilege and may even become a necessity to protect critical infrastructures in the post-digital. If, in the television age, networks were primarily broadcasting content that was often seen as the opium for the masses, in the internet age the distributed network and its participative feedback paradigm has become hegemonic, completely reversing the marginal position once held by decentralized production, while rerouting models of distribution around new centralities (read the big five: Google, Facebook, Amazon, Microsoft, and Apple). In this new economy of cultural production, no human can afford to be an island—and nonhumans can't either, as the Internet of Things promises the ubiquity of information through connecting all (un-)living things. Perhaps it is no surprise, then, that a certain "island romanticism" has resurged in the post-digital condition on a wide-ranging scale, from existing geographic islands that mobilize imaginaries (and also economies, after Brexit and offshoring scandals) of populations to the more metaphorical becoming-island inherent to the return to analog and offline media forms that promise a chance to disconnect from the command of incessant information flows.[27]

In the framework of media art and research, with its focus on technological development and artists as agents of innovation, how shall we critically account for the way that artists are consistently appropriating older technological forms? The fact that artists were early to both push the development and adopt the use of new technologies is a fact with deep historical roots. The way this history is portrayed in mainstream, contemporary accounts of art and technology, however, tends to be reductive, as artists are often either seen as the avant-garde that predict changes or as the critical force revealing the "truth" behind illusory representations of media. If we follow Zielinski's thesis in *Audiovisions*, the rise of mass media and electronic means of communication in the twentieth century can be seen as responses to different stages of industrialism, which continue to overlap and contradict each other. This in turn allows us to look at the hyperconnected condition of the

twenty-first century as a response to accelerated capitalism. What is needed in the post-digital age is a thorough reflection on the contradictions within societal and political environments in which specific technologies and artistic practices are situated. The transversal discipline of media archaeology and its diverse thinkers such as Wolfgang Ernst, Siegfried Zielinski, and Jussi Parikka have offered rich perspectives on how media history can be read against the grain as a constant hybridization of old and new. They point out how the materiality of media is inscribed within geophysical contexts and temporalities as much as within anthropocentric history. Writing this article in the context of transmediale, it has become clear to me that, although media archaeology has dealt explicitly with artists and artworks, it has not engaged fully with the interaction of artists and institutional milieus (see Parikka in this volume for an exception found in the format of the lab).

EVER ELUSIVE

In a book called *Bandbreite,* published as a tribute to the first festival director, Micky Kwella, who co-founded transmediale as VideoFilmFest in 1988, the curator Rudolf Frieling wrote that from the beginning the festival was inscribed in a permanent process of transformation that ran parallel to the constantly changing media contents and forms around which it revolved.28 In the same year, the media art historian Dieter Daniels wrote that, compared to similar festivals, transmediale managed to survive for such a relatively long time precisely because it was constantly reinventing itself. Daniel's argument echoed that of Frieling when he wrote that "the speed of innovation of media and technology prescribes the domain that is today generally known as media art to a permanent state of change of the whole medial context—from television to radio and further to the internet."29 Instead of sticking with video, a medium that at its origins sat between all chairs, not wanting to be television, cinema, or an art market commodity, VideoFest reformed itself along with changes in the mediascape during the 1990s when "new media" (meaning

mostly multimedia and the internet) were increasingly integrated into the festival program.30

When writing now, in 2016, about the soon thirty-year-old festival of transmediale, it is tempting to repeat the narrative of permanent renewal happening in tandem with technological change. This narrative, besides being a bit self-congratulatory, risks reinforcing the pervasive narrative of linear technological progress, which I would argue that transmediale has always, in different ways, formed a critical counterpoint to. It is also problematic in the present post-digital condition, in which technological and social transitions that were formerly taken for granted as indications of linear progress, are once again rendered elusive and seem to be reconfigured in new symbiotic relationships. Nonetheless, it would be revisionist to claim that transmediale did not indeed evolve alongside changing sociotechnical situations in a fairly straightforward way, from video art and the ideals of a 1970s and 1980s culture of *Gegenöffentlichkeit* to the experiments with interactive multimedia; from installations in the 1990s to net and software art and critical network culture in the late 1990s; and finally to the mainstreaming of digital culture in the latter half of the first decade of the twenty-first century.

Instead of looking back in order to arrive at the present as a logical conclusion of what came before, in my analysis of 1995 and transmediale's approach to multimedia in that year, I suggest a transversal recollection of moments of transmediale history that reorient what we take for granted in present media culture. From this reading, we might reconsider the example of the offline art form of the CD-ROM, not with a nostalgic longing for a secluded and immersive experience of "old new media," but as a blueprint for a non-streaming economy-compliant mode of producing and distributing artworks, as well as a non-template-culture idea of interaction design. The elusiveness of the present with its retromanias, its postisms, and its accelerationisms is one where past, present, and future are not structured by linear causalities, but rather foreclosed by cybernetic feedback loops and digital capitalism.31 What I suggest here is that an effective response from media practitioners in this situation can be to approach contemporary media

practice anew, not by trying to outrun these systems, but by infusing the past with post-digital imaginaries that work to manifest tangible yet non-predictable presents.

1   *VideoFest '95* (Berlin: Mediopolis e.V., 1995), 43. Translated from the German by the author.

2   Geert Lovink and Pit Schultz, "The Future Sound of Cyberspace" in *Jugendjahre der Netzkritik Essays zu Web 1.0* (Amsterdam: Institute of Network Cultures, 2010), 63–64. Translated from the German by the author.

3   Joseph Campbell, *1995: The Year the Future Began* (Berkeley: University of California Press, 2015).

4   Joseph Campbell, "FAQs About 1995," *The 1995 Blog: The Year the Future Began* (2015), https://1995blog.com/faqs-about-1995/.

5   Siegfried Zielinski, *Audiovision : Cinema and Television as Entr'Actes in History* (Amsterdam: Amsterdam University Press, 1999), 14–15.

6   Ibid., 11.

7   Richard Barbrook and Andy Cameron, "The Californian Ideology," *Mute* 1, no. 3 (1995).

8   http://nettime.org.

9   This approach becomes evident in reviewing the program statements by the festival co-directors Micky Kwella and Hartmut Horst, as well as the opening speeches and event documentation from the early VideoFest, years 1988–1995. transmediale physical archive, accessed 2016.

10  As was pointed out to me by the curator Inke Arns, *Handshake* was first shown in 1993 at the Ostranenie First International Video Festival, Bauhaus Dessau.

11  "Austellung/Exhibition," *VideoFest '95* (Berlin: Mediopolis e.V., 1995), 16.

12  Festival documentation video, transmediale physical archive, accessed 2016.

13  Geert Lovink, "Re: HANDSHAKE – VideoFest '94, Berlin," *blankjeron.com* (1994), http://blankjeron.com/sero/Handshake Feldreise/D/videofest/videofest_antworten.html. Originally sent as an email message on February 2, 1994 to luxlogis@uropax.contrib.de (Lux Logis e.V.).

14  Not to be confused with Michael Warner's later work on "Counterpublics," the term *Gegenöffentlich-keit* rose to popularity in Germany during the 1960s and 1970s, not the least through the work of Alexander Kluge and Oskar Negt in their seminal *Public Sphere and Experience: Analysis of the Bourgeois and Proletarian Public Sphere*, first published as *Öffentlichkeit und Erfahrung: Zur Organisationsanalyse von bürgerlicher und proletarischer Öffentlichkeit* (Frankfurt: Suhrkamp Verlag, 1972). VideoFest was originally organized by the organization MedienOperative e.V., founded in the late 1970s, which, similarly to many other German video workshops at the time, advocated video as a grassroots art form for producing *Gegenöffentlichkeit* through media.

15  In contrast to this turning away from online forms, there was an online presentation and communication forum of the VideoFest '95 that went und the name "Videoweb."

16  Micky Kwella, "Vorwort," *VideoFest '95* (Berlin: Mediopolis e.V., 1995), 13.

17  Ibid.

18  For a detailed account of the German history of the relationship between television and video, see Kay Hoffmann, *Am Ende Video – Video am Ende? Aspekte der Elektronisierung der Spielfilmproduktion* (Berlin: sigma, 1990).

19  See Sandra Fauconnier, "The CD-ROM Cabinet after 6 months…" *AAAN.NET* (2013), http://aaaan.net/the-cd-rom-cabinet-after-6-months/. See also Marie Lechner "Welcome to the Future! 2. New Art Forms," *imal Center for Digital Cultures and Technology* (2015), http://www.imal.org/en/page/welcome-future-2-new-art-forms/.

20  Marie Lechner, interview with Antoine Schmitt, "Welcome to the Future Interview: Antoine Schmitt," *imal Center for Digital Cultures and Technology* (2015), http://www.imal.org/en/wttf/texts/interview-antoine-schmitt/.

21  Geert Lovink says: "What makes cd-roms so unique is also its greatest weakness: it is a closed environment, a data monade. The best cd-roms are still more complex than the internet today, 20 years later, in particular if you look at it from the average user perspective who is encapsulated into the limited template culture of the dominant social media platforms. Needless to say, cd-roms were NOT social." Marie Lechner, interview with Geert Lovink, "Welcome to the Future Interview: Geert Lovink,"

*imal Center for Digital Cultures and Technology* (2015), http://www.imal.org/en/wttf/texts/geert-lovink-interview/.

22  Treister also states: "An art cd-rom could not store user data as it is a burnt disc. ROM stands for Read Only Memory." Marie Lechner, interview with Suzanne Treister, "Welcome to the Future Interview: Suzanne Treister," *imal Center for Digital Cultures and Technology* (2015), http://www.imal.org/en/wttf/texts/Suzanne-Treister-Rosalind-Brodsky/.

23  Daphne Dragona, "From community networks to off-the-cloud toolkits art and DIY networking," lecture, *Hybrid City Conference III: Data to the People*, Athens URIAC, September 18, 2015; Panayotis Antoniadis and Ileana Apostol, "The Right(s) to the Hybrid City and the Role of DIY Networking," *The Journal of Community Informatics* 10, no. 3 (2014).

24  Eric Kluitenberg, "The New Cultural Politics of Difference" in *Book of Imaginary Media: Excavating the Dream of the Ultimate Communication Medium*, ed. Eric Kluitenberg (Rotterdam: NAi Publishers, 2006), 8. For an exploration of Anderson's idea in relation to the imagined aspect of communication networks, see Wendy Hui Kyong Chun, "Networks NOW: Belated Too Early," in *Postdigital Aesthetics: Art, Computation and Design*, eds. David M. Berry and Michael Dieter (London: Palgrave McMillan, 2015), 289–315.

25  Kristoffer Gansing, "The Transversal Generic: Media-Archaeology and Network Culture," *The Fibreculture Journal*, no. 18 (2011); Kristoffer Gansing, *Transversal Media Practices: Media Archaeology, Art and Technological Development* (Malmö: Malmö University Press, 2013).

26  As an artistic medium, video had a long, troubled relationship to television, as the two were often conflated in the 1960s and many "video artists" were either aspiring to be or doubling as tele-vision artists. Sometimes this was due to a conflation of video with television simply because of the electronic monitor-based presentation, but also because of a hybrid situation where broadcast television was among the first distribution channels for video art and more generally for video-based production. In 1970, however, Gene Youngblood wrote: "It is essential to remember that VT is not television: videotape is not television though it is processed through the same system." By the late 1970s it seems as if the art world had also taken up this distinction, as video art was increas-ingly institutionalized as an art form separate from television, evident by the presence of a "VT ≠ TV" sign quoting Youngblood at documenta 6 in 1977, and the emerging theorization of video as a medium set apart from television. Gene Youngblood, *Expanded Cinema* (New York: E.P. Dutton & Co. Inc., 1970), 281; Kathy Rae Huffman, "Video Art: What's TV Got To Do with It?" in *Illuminating Video: An Essential Guide to Video Art*, eds. David Hall and Sally Jo Fifer (New York: Aperture Foundation, 1990), 81–90.

27  See Florian Cramer's article "What is 'Post-digital?'" for a critical reconsideration of the retrotendencies of young art practitioners who might not have grown up with analog techniques in design, photo-graphy, and film in the first place. Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (Aarhus: Digital Aesthetics Research Center, Aarhus University, in collaboration with transmediale/reSource, 2014), http://www.aprja.net/?p=1318/.

28  Rudolf Frieling, "1989 und 2000: Wendepunkte eines Medienfestivals" in *Bandbreite Medien zwischen Kunst und Politik*, eds. Andreas Broeckmann and Rudolf Frieling (Berlin: Kulturverlag Kadmos, 2004), 141–149.

29  Dieter Daniels, "transmediale," *Kulturstiftung des Bundes*, no. 3 (2004), 32. Translation from the German by the author.

30  Ibid.

31  A similar argument was recently put forward by Armen Avanessian and Suhail Malik with the notion of the "post-contemporary," through which they wish to discuss how, in the current stage of neo-liberalism, the present is preconditioned by the future. In their conception this is a future produced from probabilistic models that structure financial and increasingly sociocultural systems of interaction. Echoing the work of accelerationists like Nick Srnicek and Alex Williams, they go on to argue that the urgent task today becomes engaging in new production in ways that take non-representational systems into account. My argument here, however, is that such a seemingly oppressive temporal system does not have to be responded to in a way that follows the internal logic of the system, but rather that the systems of neoliberalism and digital capitalism can also be thwarted by producing post-digital counter-imaginaries that establish other temporal orders. See Armen Avanessian and Suhail Malik, "The Time-Complex. Postcontemporary: A Conversation between Armen Avanessian and Suhail Malik," *DIS Magazine* (August 2016)*,* http://dismagazine.com/discussion/81924/the-time-complex-postcontemporary/.

# Dieter Daniels
# Whatever Happened to Media Art?
## A Summary and Outlook

In the previous decade, there was a lot of talk about a crisis of media art. Take, for example, theorist Stefan Heidenreich's review of transmediale 2008:

> Media art was an episode. But since the institutions that support it are still extant, it survives as a dinosaur from the 1980s and '90s. [...] Artists work with any media they choose, from drawing to the Internet. [...] There is a wealth of good art that naturally works with media. But there is no media art.[1]

This text provoked considerable debate, which can be retrieved from the archives of the German *Rohrpost* electronic mailing list. Internationally, a similar discussion followed the announcement that same year by Ekow Eshun, director of the London ICA, that he would close the Live and Media Arts Department. His justification read: "It's my consideration that, in the main, the [media] art form lacks depth and cultural urgency."[2] And in 2010, German media theorist Florian Rötzer characterized media art as a "creature artificially kept alive, lagging far behind expectations."[3] Even earlier, some insiders of the media art scene had already struck an ironic distance from it, as witnessed by an exhibition title like *The Art Formerly Known as New Media*, which took place in 2005 in Canada.[4]

The next decade saw attempts at revisiting, historicizing, or even resurrecting it. In 2010, Sarah Cook and Beryl Graham would attempt to legitimize a specification of media art in their book *Rethinking Curating: Art after New Media*, under chapter headings that read "How New Media Art Is Different" and "Why Would a New Media Artist Want to Exhibit in an Art Museum?"[5] Two years later Claire Bishop asked, "whatever happened to digital art?" in her essay "Digital Divide" for *Artforum*'s 50th Anniversary issue.[6] Her ideas were responded to by Lauren Cornell and Brian Droitcour's equally polemic

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response, "Technical Difficulties," in the January 2013 issue, which sparked a larger controversy online. In her response to the overwhelming "indignation from proponents of new media" like Cornell and Droitcour in reaction to her article, Claire Bishop clarified that the text was "foremost a critique of the dominant tendencies in contemporary art since 2000, as found in museums, galleries, and biennials [...] It's not an article about new media or digital art." Nonetheless, she diagnosed a divide between "a mainstream art world that is still invested in the analog" and "a self-marginalizing alternative called new media art that asserts its own relevance for the future."[7] In other words, according to Bishop, the specificity of new media as a genre claimed by Cook and Graham in 2010 was in fact a self-imposed deficit. Of course, that is the case only if the so-called mainstream art world remains the measure of all things.

Since about ten years ago, the theory of media has seemed to face a similar dilemma: As media art, how can its Translated from the German by Lutz Eitel definition as a separate field be legitimate if media technology has become part and parcel of our everyday life? Put the other way around: can a genre of art or theory exist as an entity outside media technology and its cultural significance, without either explicit reference or implicit dissociation? Isn't every form of theory necessarily media theory today? Doesn't every artwork to a certain extent belong in the field of media art? Take, for example, the series of lectures at the University of Vienna between 2006 and 2008, curated by Claus Pias, with the title "Was waren Medien?" or "What were the media?" A first sketch of the ideas in this text was presented during that series.[8]

Digital technology seems to have embedded or rather (de-) materialized and (de-)constructed some of the debates about and visions of "new media" from the preceding decade, which have been ultimately commoditized and capitalized on by so-called social media and its related hardware. As Andreas Broeckmann, artistic director of transmediale from 2000 to 2007, put it:

> The notion of "new media" is a concept of the past. A date that can be taken as marking the end of "new media" is the introduction of the Apple iPhone in 2007 [...] The future is

no longer a mystical, utopian site, but merely the time for the next version update that will no doubt arrive and be offered for download, one way or another. And given that we look at the technological developments of the future without doubt, we also look at them without hope. We can speculate that future technologies will not be twentieth-century-type "new media," and "digital" only in the most banal sense of the word, but environmental or ecological technologies.9

Since then, most critiques of media art and theory have thrived on the fact that the genre used to subscribe to the euphoria around new media and the bright future the digital technology seemed to promise during the 1980s and 1990s. These were symptoms of a boundless desire for modernism blazing up for maybe the last time, bracing itself against looming postmodern tendencies.

In the nineteenth century (media) art was already defensive against the radical progress that science and technology had to offer, against their positivist postulations of final truths. This is why Baudelaire, standing at the beginning of modern art theory, championed an artistic "order of the imagination," where there was no causally established, progressive link from Signorelli to Michelangelo or from Perugino to Raphael. Instead Baudelaire suspected that "unending progress would be humanity's most ingenious and cruel form of torture."10 Whereas the Futurist founding manifesto in 1909 called for the arts to "sing" technological progress, subsequent manifestos from other groups demanded, conversely, that new technologies be used as aesthetic instruments. By the 1920s, artists from the scenes surrounding the Bauhaus, Absolute Film, and Dadaism were no longer satisfied using technologies that already existed, and instead of merely recycling inventions made for other purposes, they developed new methods and objects, often with the help of engineers.11

Falsified theories in the natural sciences end up among the paradigms that have "died out" (according to Thomas Kuhn), while obsolete media technologies end up in the graveyard of "dead media" (in the words of Bruce Sterling).12 Art, on the

other hand, even if it uses technical media that quickly become obsolete, always has an eye toward the eternal. On this point we also can refer back to Baudelaire, who believed the supreme challenge for modern art was "to distil the eternal from the transitory."13

Today, historians and theorists of science have increasingly come to criticize the separate notions of progress that underlie the arts and sciences, a separation with roots still firmly stuck in positivist self-conceptions. In *Science as an Art* (1984), Paul Feyerabend reached back to traditional art-historical methodology and used it to define a new history model for the sciences.14 According to him, a belief in absolute progress in the natural sciences was self-deceit, even "totalitarian thought." Instead, the art-historical model, which allows for simultaneous, alternate developments, would describe the situation of the sciences more adequately. Bruno Latour's proposition that *We Have Never Been Modern* continued and expanded on these thoughts. His book is first and foremost a critique of the strict separation between nature and society in the modern natural sciences, while also censuring postmodernism as "a symptom, not a fresh solution."15 Latour sees an alternative in an interpretation of modernity not as a radical break with the past, a single revolution, but rather as a processual, iterative model where hybrid conditions are continually translated and interconnected. Therefore, arriving at an absolutely modern age that can never be overtaken by the past remains an unrealizable goal. Latour's theory of science has proven similarly useful in discussions of the arts. In a complex interplay between methods and subject areas, Feyerabend imports art-historical methods to remodel scientific theory, while Latour's science theory is adopted and developed by art theorists.

This leads us back to the question of how to define media art, since such an interplay between art history and science theory has stimulated artistic practice since the 1960s. "Art, science, and technology" used to be a typical title for diverse international activities that could not be subsumed under the name of a movement or a manifesto, and which offered a critique of technological consequences while still following a fascination with the possibilities of the new technology.

The "heroic" founding period of what has come to be labeled media art began around 1960, while the term itself was used much later, roughly from the 1990s. Initially there was a convergence of multiple factors that developed, partially independently, from the 1950s through the 1970s, which could increasingly be described as coherent. Belonging to those movements was electronic music of the 1950s (Karlheinz Stockhausen, Pierre Boulez, John Cage, the electronic studio of the WDR radio station in Cologne, the music journal *Die Reihe*), open works of art (John Cage and Umberto Eco), cybernetics (in theory as well as experimental practice), reflections on mass media (in literature, art, and music, from Burroughs to Warhol and Cage), computer graphics, the Experiments in Art and Technology group (E.A.T.), the expanded cinema movement, "intermedia" art (fluxus, happenings, the Gutai group), the New Dance (Yvonne Rainer, Simone Forti, Trisha Brown), conceptual art and site specific art (including its manifestations on film and photographs), body art and experimental theater (from Samuel Beckett to Bruce Nauman) and institutional critique and political activism (from Hans Haacke to Dan Graham).

What today trades under the name of media art used to be a hybrid area where multiple interdisciplinary cross-connections and collaborations were possible without forming a common conceptual or strategic identity. Important stimuli for both technological practice and artistic theory originated in simultaneous developments in cybernetics during the 1960s, a transdisciplinary bridging of the gap between the "two cultures" of natural sciences and the humanities. In the 1960s, these contexts were not limited to the fine arts—in the way that media art is categorized today—but as a matter of course included literature, music, and the performing arts. This let the genre survive the crumbling contexts of intermedia art, cybernetics, and the "art, science, and technology" movement, though it increasingly came under pressure to define its special characteristics and to define itself against the more "classical" arts.[16] The work of Nam June Paik is exemplary in this context. In his famous *Exposition of Music—Electronic Television* in 1963, he combined elements of New Music, randomness, the open work of art, mass media, and intermedia to arrive at a partici-

patory, totalizing work of art "for all senses."[17] Paik used and modified pianos, tape recorders, record players, and TV sets for a kind of DIY bricolage that anticipated the future potential of distribution-media-turned-production-media and their new interactive uses. Paik's complete ensemble—most of which does not survive and has only been documented in black-and-white photographs—can be seen as a precursor to video art, sound art, installation art, and interactive art in equal measure.

This kind of intermediality defined the "heroic" phase of media art, but by the beginning of the 1970s distinct disciplines began to establish themselves more strongly; the craze of mixing media gave way to a quest for media-specific artworks. The reasons for this development today seem like a crude mixture of two irreconcilable theories: on the one hand, Clement Greenberg's modernism, driven by the paradigm of a self-referentiality immanent to the artistic medium, as well as his judgment against intermedial tendencies; on the other, Marshall McLuhan's maxim that the medium itself—or the choice of a medium—carries one, if not *the* central message. During the course of the 1970s, the field of media arts diversified, highly specialized scenes and contexts replacing the intermedial blend of the 1960s. Among the major categories were: computer graphics, video art, experimental cinema, and performance art. Each of these art forms started developing a specific identity that would rely on its medial difference from related forms—the aim was to define an autonomous genre by virtue of its technical medium. In video art competitions of the 1980s, juries would still consider experimental film transferred to video as attempted fraud, and in computer art manually complemented computer graphics were seen as gaffes at best.

Increasingly, these genres have been collected under the fine arts umbrella. This may partly be due to pragmatic concerns, since discourses and institutions within the fine arts are more open to experiments than those of music, literature, film, or theater, which are often stuck in a conflict between the avant-garde and the mainstream. Each of these genres has also developed subgenres according to its diverse artistic approaches—for example, in video art or in experimental film, subdivisions have arisen between structural/formal, conceptual,

narrative, and sociopolitical practices. This is comparable to the rivalry between the different, partly national "schools" of electronic music in the 1950s: French *musique concrète* and compositions based on found sound; "serial music," which was mostly developed in Germany and was based on rigid mathematic concepts (see the above-mentioned journal *Die Reihe*); and American indeterminacy after John Cage, who criticized conventional concepts of authorship.

Within these diverse artistic practices there already lay a problem in defining genres through their use of media technology. Completely heterogeneous approaches were placed in close relation, emphasizing the shared technical format and suppressing the differences in its use and the artistic intention behind it. As one example, Bruce Nauman's early video pieces were based on performances in front of a camera and were intended to be shown in a gallery context. Their low-tech aesthetics and long real-time durations made them unfit for TV broadcast. On the other hand, almost all of the videos that Nam June Paik produced from 1969 were explicitly made for TV shows, and the use of experimental high-end studio technology—partly developed by Paik himself—was made possible by the financial support of TV channels. Today, these tapes are wrongly viewed by art historians only within an art context, while really they are media theory in practice.[18] Accordingly, Paik started his *Global Groove* from 1973 with the motto: "This is a glimpse of a video landscape of tomorrow, when you will be able to switch on any TV station on the earth and TV guides will be as fat as the Manhattan telephone book." To understand the "global channel zapping" simulated in this video, one must recall that in the 1970s, long before satellite broadcasting, television was still a national (or, especially in the US, even regional) affair. The theoretical groundwork of *Global Groove* was developed by Paik three years earlier: "If we could compile a weekly TV festival made up of music and dance from every country, and distributed it free-of-charge round the world via the proposed common video market, it would have a phenomenal effect on education and entertainment."[19] In this scenario, (media) art would no longer compete for the latest advances in art, but on the contrary *anticipate*

*the future of media technology and its repercussions in society.* In Paik's work this occurred through an affirmatively utopian scenario (and elsewhere through media critique).

Paik included implicit media theory in his art as early as 1963 with *Participation TV*. Way back when Germany had just a single television channel, Paik's work presaged interactive mass media developments.[20] These were the days when Marshall McLuhan postulated that media theory should not only analyze the status quo, but instead, if it wanted to be taken seriously, must influence the area under investigation: "Control over change would seem to consist in moving not with it but ahead of it. Anticipation gives the power to deflect and control force."[21]

Despite the fact that in the 1970s electronic art was supported by TV channels and the computer industry, both of which supplied grants and means of production, its long-term economic base and also its cultural discourse were still with the fine arts and its network of galleries, collectors, and museums. Yet despite this basis, far into the 1980s it remained impossible to even cover the expenses for production and hardware through the art market. Most media artists would thus live within a dual economy and combine grants and other art-world resources with industry commissions or TV broadcast sales. Only a few artists could successfully transfer their work for the television mass medium back into an art context—as Paik did with his 1977 *TV-Garden*, a room-filling installation based on the *Global Groove* video, which he presented at documenta 6 in Kassel and later sold to the Guggenheim Museum. In contrast to Paik, many quite successful media artists vanished from the art scene because their creativity could be used more profitably in the media industry; John Whitney and John Sanborn come to mind here.

The beginning of the institutionalization of media art at the end of the 1960s is an outcome of this situation even if the term itself still wasn't used. A selection of institutionalized initiatives would eventually include:

—1967–70, Experiments in Art and Technology (E.A.T.)
—1968–today, *Leonardo* magazine

—1968–80s, Computer Arts Society (CAS)
—1969–1973, Television Gallery Gerry Schum
—1971–today, Electronic Arts Intermix (EAI)
—1971–today, The Experimental Television Center
—1968–today, Center for Advanced Visual Studies (CAVS)
  at MIT

These initiatives depended on diverse organizational models and followed different aims. They shared that they were initiated by individuals fighting for a cause, not by public institutions making top-down decisions. They were based on what today we call public-private partnership, a combination of public funds and private sponsors that was uncommon then (if more uncommon in Europe than in the USA). The Center for Advanced Visual Studies was a special case, since MIT functioned as its powerful parent organization, but it later became the standard model for new institutions throughout the 1980s.

All these initiatives developed platforms for the production and distribution of electronic art outside of the established art institutions. At the same time, they explicitly positioned themselves between the cracks of classic artistic genres and concepts of artistic or economic success within the dual economy described above. In the course of their development they met with problems: could the electronic arts defend and extend their hybrid cultural-industrial and artistic-technological position, or would they time and again flounder at the incompatibility of economic and aesthetic criteria?

That this question would remain relevant for the 1980s became obvious during the second phase of institutionalization, which was no longer restricted to individual initiatives but took on larger dimensions and more public cultural significance. Only then did the term media art come into use. Unfortunately, a historical overview of media art institutions is missing to this day, which makes it even more difficult to write a comprehensive history of the term and its multiple meanings.

Here are some major event-based initiatives from the institutionalization of media art in the 1980s, sorted by founding date (without claim to completeness; some are no longer active):

—1978, Montevideo, Amsterdam
—1979, Ars Electronica, Linz
—1980, Video Art Festival, Locarno
—1981, Experimental Film Workshop, Osnabrück (after 1988 renamed the European Media Art Festival)
—1982, World Wide Video Festival, The Hague
—1982, *Infermental* video magazine
—1983, Time Based Arts, Amsterdam (in 1993 fused with Montevideo to form Netherlands Media Art Institute)
—1983, Manifestation Internationale de Video, Montbéliard
—1984, Videonale, Bonn
—1984, Marler Video-Kunst-Preis, Skulpturenmuseum Marl
—1984, Hull Time Based Arts (HTBA)
—1986/87, V2_Institute for the Unstable Media, Rotterdam
—1988, Videofest, Berlin (renamed transmediale after 1997)
—1989, Artec Biennale, Nagoya
—1989, MultiMediale, Karlsruhe

In the context of these festivals and institutions, media art finally began to take shape as a specialized discipline defined by the social network of an international community, who, in different locations, had to win a similar fight against the marginalization of the genre. In a sense, since the 1980s media art has really taken place in a "global village," spread over the globe but still familial in size. The institutional standing of these initiatives has varied widely: Ars Electronica, for example, received support from the city of Linz and national broadcaster ORF early on and became an official cultural attraction for the area, whereas the Videonale Bonn, initiated by a group of students in a small project room, only very slowly worked itself into stable funding and an institutional haven in the municipal art museum. Often these activities started as one-offs, which met with such success, or were so persistently pushed by the initiators, that they became recurring events. Some of events evolved from the festival stage into more durable institutional forms—Ars Electronica is again a good example here.

The significance of this second phase of institutionalization for the implementation of the term media art became clear in the renaming of the Osnabrück, Amsterdam, and Berlin ini-

tiatives during the 1990s. "Media art" had come to stand not for a separation, but for a reintegration of different genres like video art, sound art, and interactive art. In turn, the "global village" increasingly distanced itself from the field of "contemporary art," and media art became more rarely seen in the biennials and documentas—not to mention the art market and museum collections—than it had been a decade earlier. A central cause for the marginalization of media art within the fine arts context was that, after a period of conceptualism, the latter had become museum-friendly again, with newly opened postmodern museum buildings to house it and a rising importance of private collections in public opinion.

From the end of the 1980s, a stronger interest in connecting media art and media theory became obvious. The reasons for that, besides the fact that media art was disconnected from the fine arts discourse, lay in the growing establishment of media studies as an academic discipline in its own right. The broader public's growing interest in digital innovations was also important for artistic interventions in the field. Eight initiatives were typical of these developments:

—1988, ISEA Inter-Society for the Electronic Arts
—1990–2000, Interface Conference Hamburg
—1990, HyperKult—Computer als Medium
—Then, during the 1990s, large public institutions explicitly founded for media art finally established themselves. Major institutions of this third phase were:
  Zentrum für Kunst und Medientechnologie, Karlsruhe (ZKM) (institute and foundation formed in 1989; center opened in 1997)
—1989, Institut für Neue Medien (INM) at the Städelschule, Frankfurt am Main
—1990, Academy of Media Arts, Cologne (KHM)[22]
—1993, Ars Electronica Center, Linz (AEC)
—1997, Intercommunication Center, Tokyo (ICC)

As mentioned, a reference model for these institutions was the Center for Advanced Visual Studies (CAVS) at MIT, since it was connected to a large university and research institute.

The economic power of MIT was a political factor, while the mission of the institution was clearly defined as cultural. This can be shown in two longer excerpts from the concept papers of two German institutions, which deserve a closer look.

*Koncept '88*, the founding document of the ZKM Karlsruhe, states:

> Because of the distribution and almost limitless availability of new media like e.g. television, radio, video, computer graphics, holography, cassette recorders, personal stereos, CDs etc. people relate to art and also to technology in a different manner today. Art like technology now plays an integral and decisive role in all matters of everyday life and culture. [...] The Centre for Art and Media Technology therefore will be a centre for a human technology. It will develop one of the most immediate manifestations of life in the human spirit—the desire for aesthetic expression—and reconcile it with technology.[23]

The founding concept of the KHM Cologne, ca. 1989/90, states:

> The academy is devoted to modern methods and technologies of image production and transmission, which increasingly become part of current design and art practice. This especially includes a critical analysis of media culture and a responsible and moral use of mass media.
> Objectives:
> 1. An influence on media developments (through arts, design and sciences). The aim is cultural integration to prevent an expansion that is purely technologically oriented.
> 2. Promotion of a close cooperation between artists, designers, authors and directors working for movies and TV, scientists and engineers.[24]

These concepts contain some of the arguments we have already encountered during the above sketch of media art history: themes from the 1960s, like intermedia and the dialogue between two cultures, were now applied to the relationship be-

tween art and technology in the digital realm. The remnants of a Futurist desire for an artistic design of things to come, and a mission to improve the world, were now embedded in a context of social outreach and pedagogy, as opposed to that of the elite avant-garde.

Standard elements of media theory and the philosophy of technology also came into play. The technological optimism of McLuhan, who believed that it was possible to control and change media through anticipation, went together with a characteristically German skepticism of technology that harks back to Theodor Adorno's critique of the culture industry and Martin Heidegger's warning that technology would make us fall into self-estrangement.

These texts were not artist manifestos or individual initiatives drawn up according to an ideological motivation; these were texts immediately connected to political decision-making and designed with budgets, appointment schemes, equipment depots, and huge buildings in mind! In fact, the programs and projects from the "heroic age" before media art have now, after thirty years, reached the stage of practical politics. This is not due to the persistence of the artists involved. Instead the changes in the media environment have now become so obvious that the necessary reaction from culture and education planners seems almost belated.

Reflecting upon the changes that "new media" brought to life in the 1990s though artistic and theoretical means was a central motive of these founding documents. Still, it didn't become clear how the cultural mission of these institutions would be positioned in face of the growing self-evidence of digital media. Simultaneous with the founding of these specialized institutions, digital technologies radically de-specified. They have become everyday tools, implemented in all reaches of social life, which makes the status of a special institution, designed to develop them artistically, so much harder to justify. It doesn't help that the research mandate stressed in the founding concepts of the ZKM and the AEC since then has gradually been sacrificed for the more effective publicity of event organization.

Another central factor contributing to the current legitimation crisis of institutions founded during this third phase

in the 1990s is that, today, electronic images are largely integrated into contemporary art. In particular, video art pieces are presented in all major survey exhibitions—and they are no longer labeled video art, since the medium has taken its equal place beside photography and painting. While, during the 1980s, video tapes still sold for low standard prices even if the artist was quite prominent, today there is a fully developed price structure for video on the art market, and limited edition copies can demand six-figure prices.25 These market mechanisms repeat the way photography was absorbed into the art market in the 1970s. On the other hand, unlike video, digital media art (interactive art, net art, software art, and so on) is still a tough sell, often donated by the artist for free if an institution agrees to preserve and display it. This has nothing to do with the artistic significance of the work; it speaks of a basically conservative art market that has become the ruling force for museums and private collections.

Even the titles of pertinent book publications suggest a growing separation between video and media art. For example, the World of Art series from Thames & Hudson has four volumes, titled: *Video Art*, *Digital Art*, *Internet Art*, and *New Media in Art*.26 While the "iconic" video medium managed to transition into an art context, processual, experimental, participative media art more than ever remains a specialized artistic discipline. The model of a reintegration of media art genres under a common media art umbrella, which came up during the second phase of institutionalization in the 1980s, seems no longer viable. Today "being digital" is no longer a criterion for artistic or even cultural innovation. New strategies and terms have begun to emerge: in the wake of techno music, the term post-digital has found currency (it was introduced in 2000 by Kim Cascone to describe so-called glitch music, where failures in the digital media are exploited creatively), while in the visual media arts there is a trend toward the "neo-analog," a return to simple DIY techniques.27

This is why the initial motives of a cultural separation between "high art" and media innovation, which led to the founding of institutions during the third phase, are not outdated—but they should be integrated into an overarching cultural research

concept, where art history (for the fine arts, music, film, and theater alike), media theory, scientific theory, and the cultural sciences study the role of digital media from a multitude of perspectives. But the necessities that lead institutions like ZKM and AEC to organize popular blockbuster exhibitions work against this aim. The show "YOU_ser 2.0: Celebration of the Consumer" at ZKM in 2009 above all proved that the exhibition format cannot compete with the possibilities of Web 2.0. The exhibition could not match the goal defined in its program: "YOU are the content of the exhibition! [...] Through their participation, the YOU, the user, has the chance to change the world."[28] The same year was the reopening of the Ars Electronica Center in Linz, whose exhibit "New Views of Humankind" hardly featured any art or electronic media, but rather popular scientific presentations of biotechnology and robotics.

The most urgent questions can today no longer be dealt with in exhibitions, symposia, and catalogue publications alone. Instead they require new formats that use digital media to reach their audiences, as do online scientific platforms, common in the natural sciences. Since 2000, there have been some exemplary ventures, including the platform netzspannung.org at the Fraunhofer Institute for Intelligent Analysis and Information Systems (IAIS), which concentrates on online teaching and networking, and the platform mediartnet.org at ZKM Karlsruhe, where content is organized featuring thematic complexes, cultural contexts, and work analyses. While these platforms are accepted tools for the distribution of knowledge, their contribution to the theoretical field has hardly been recognized, since art history, media theory and cultural studies are still focused on the book format.[29] Both of these online projects were financed through external funding and, unfortunately, after support expired, were not continued or even updated by their respective institutions.

There are few examples of a fourth phase of institutionalization, in which media art is historically defined within the hybrid contexts of culture, technology, society, and science. Institutes like the Daniel Langlois Foundation in Montreal and the Ludwig Boltzmann Institute Media.Art.Research. in Linz tried to fulfil the task of making media art accessible in all its complexity, of

documenting and preserving important works, and explicitly integrating new distribution channels of the internet into their approaches and creating extensive online content.[30] Both initiatives, however, have been discontinued or cut down respectively, for quite different reasons, before they could make a widespread impact.[31] The "dinosaurs from the 1980s and 1890s," to recall the phrase quoted at the beginning of this essay, institutions of the third phase like ZKM or AEC remain established in cultural politics, but they are no longer legitimized through the belief in progress that defined the former "new media." Names chosen in the 1990s for the departments of the AEC in Linz, like "Museum of the Future" and "Futurelab," sound old-fashioned already. The other side of this fixation with the future is uncritical self-historicization on the part of institutions (the self-display on the occasion of the ZKM's ten-year anniversary in 2007, and only three years later, their twenty-year anniversary of the ZKM foundation, as well as the coffee-table book *Ars Electronica 1979–2009: The First 30 Years*).

One decisive challenge for the future of media art is the preservation and documentation of its fragile electronic past. Both analog and digital information suffer from decay, and the newest hardware or software technology ages the quickest because of the perpetual necessary upgrades. The preservation of digital cultural heritage is a topic that has bearing on all reaches of cultural production, but media art may be the most obviously problematic area. Many media artworks depend on individual technical solutions and cannot be standardized to save data or functionality. It is not the acquisition budget that really counts for a collection of media art (often artists will feel it in their best interest to donate works to institutions), but permanent funds to preserve the works over time (either migrated to new formats or otherwise documented, depending on the medium), which has only lately been registered on the agenda of cultural politics.[32]

Arguments for the significance of such preservation reach far beyond the context of media art. Select examples of media art can be seen as cornerstones in the development of a historical consciousness of the relationship between media culture and media technology. On the other hand, individual approaches

by media artists that proved innovative in their time can become useful for developing models for digital heritage beyond the standards of video and audio media. Besides the mere preservation of works, media art demonstrates the importance of thorough documentation of artistic intentions, concepts, and contexts, as well as their embeddedness in their historical framing.33 The institutions of the third phase have so far achieved these aims only marginally or not at all. The most immediate problem today is that both the preservation of the digital heritage and the production or event-based display of new media art have to be paid for by the same budget. This means that, if taken seriously, the preservation of the past will eat up investments in the future of media art.34 The material preservation of media art and documentation of its cultural technological context as a historical phenomenon will therefore require a radical reorientation necessary both for an understanding of media art and its legitimization as a specific discipline in the future.

POSTSCRIPT ON "POST"-NESS

The shifting and often confusing concepts of "post-media" could be taken as a parallel history to the developments in media art presented here.35 Félix Guattari's 1990 vision of "the beginning of a post-media era of collective-individual reappropriation and an interactive use of machines of information, communication, intelligence, art and culture; the "postmedia condition" of contemporary art that Rosalind Krauss described in 1999; the Post-Media Lab established 2011 at the Leuphana University of Lüneburg—they all seem to share little common understanding of "post-media."36 While the launch of postmodernism in the 1980s had a huge impact on reformatting contemporary art and its framing in architecture, the post-media status of contemporary art seems rather to reaffirm the status quo and the dominance of the art market as heritage of postmodernism.37

Can the recent epidemic of "post"-ness, including post-internet and post-digital art, provide an opportunity to escape some of the redundancies of the historical media art debates sketched out in this essay? Maybe, but only if post-ness is no longer taken as a temporal category, in the sense of the "old

newness" of media art as the last of the avant-garde, and the post-digital instead becomes as permanent and as pervasive as the digital already is. This non-temporality seems to be the common ground of post-digital practice and recent theories of post-contemporary art, so there is a chance that the divide of what used to be called media art and what used to be called "mainstream" contemporary art will become more fuzzy than ever.38 ∎

Translated from the German by Lutz Eitel.

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1    Stefan Heidenreich, "Es gibt gar keine Medienkunst!" trans. Lutz Eitel, *Frankfurter Allgemeine Sonntagszeitung*, January 27, 2008.

2    See Lyn Gardner, "Ekow Eshun and the ICA's Death Blow to Live Art," *Guardian*, October 23, 2008, http://www.guardian.co.uk/stage/theatreblog/2008/oct/23/ica-live-arts-closure; see also Momus, "Is Live Art Dead?" *iMomus*, October 24, 2008, http://imomus.livejournal.com/409301.html (all links accessed November 1, 2011).

3    *Neue Medien in der Kunst. Geschichte – Theorie – Ästhetik*, Symposium at the Akademie der Bildenden Künste, Munich, January 21–22, 2010.

4    "The Art Formerly Known as New Media," exhibition, curated by Sarah Cook and Steve Dietz, Walter Phillips Gallery, Banff, September 18–October 23, 2005.

5    Sarah Cook and Beryl Graham, *Rethinking Curating: Art after New Media* (Cambridge, MA: MIT Press, 2010).

6    Claire Bishop, *Digital Divide, Artforum*, September 2012, 434–41; see also comment thread: http://artforum.com/talkback/id=70724.

7    "Claire Bishop Responds," *Artforum*, January 2013, 38.

8    See the full program and audiofiles at: http://homepage.univie.ac.at/claus.pias/aktuell/WasWaren Medien/WasWarenMedien.html.

9    Andreas Broeckmann, "Art beyond the Digital Age," in *No Internet, No Art—A Lunch Bytes Anthology*, ed. Melanie Bühler (Amsterdam: Onomatopee, 2015), 320–21.

10   Charles Baudelaire, *Œuvres complètes*, vol. 2, ed. Claude Pichois (Paris: Gallimard, 1976), 581.

11   See *Artists as Inventors—Inventors as Artists*, eds. Dieter Daniels and Barbara U. Schmidt (Ostfildern: Hatje Cantz, 2008).

12   See Thomas S. Kuhn, *The Structure of Scientific Revolutions* (Chicago: University of Chicago Press, 1962); Bruce Sterling, "The Dead Media Project: A Modest Proposal and Public Appeal," *Dead Media*, http://www.deadmedia.org/modest-proposal.html.

13   See Walter Benjamin's analysis of Charles Baudelaire's *À une passante* from *Les Fleurs du Mal*. Benjamin, *Gesammelte Schriften*, vols. 1/2, eds. Rolf Tiedemann and Hermann Schweppenhäuser (Frankfurt am Main: Suhrkamp, 1977), 547.

14   Paul Feyerabend, *Wissenschaft als Kunst* (Frankfurt am Main: Suhrkamp 1984). See also his shorter essay in English, "Science as an Art: a Discussion of Riegl's Theory of Art and an Attempt to Apply It to the Sciences," *Art & Text,* nos. 12–13 (1984): 16–46.

15   Bruno Latour, *We Have Never Been Modern* (Cambridge, MA: Harvard University Press, 1992), 46.

16   Douglas Davis paints a last panorama of these developments in *Art and the Future: A History-Prophecy of the Collaboration between Science, Technology and Art* (London: Thames & Hudson, 1972).

17   See *Nam June Paik: Exposition of Music: Electronic Television Revisited*, ed. Susanne Neuburger, exhibition catalogue, Museum Moderne Kunst Stiftung Ludwig Wien (Cologne: Walther König, 2009).

18   See Claus Pias's attempt to find implicit media theories within the practice of developers of 1960s media technology—theories that proved so operational that they became the foundation of today's media reality, but are no longer familiar or even available as theory. For example: "Asynchron – Einige historische Begegnungen zwischen Informatik und Medienwissenschaft," *Informatik-Spektrum* 31, no. 1 (2008): 5–8.

19   Nam June Paik, "Global Groove and Video Common Market," in *Video 'n Videology 1959–1973*, ed. Judson Rosebush (Syracuse: Everson Museum of Art, 1974).

20   See Dieter Daniels, "Touching Television: Participation Media with Marshall McLuhan, John Cage and Nam June Paik," in *TV Commune, de- inter- trans-* (Gyeonggi-do: Nam June Paik Art Center, 2011), 157–80.

21   Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw Hill, 1964), 199.

22   Many other new study courses for media art, media design, interface culture, and so on could be named here, but this would require its own essay.

23   ZKM–Arbeitsgruppe, *Konzept '88*, ed. Michael Heck, trans. Lutz Eitel (Karlsruhe: Zentrum für Kunst und Medientechnologie, 1988), 5, 8.

24   "Grundkonzept der Kunsthochschule für Medien Köln," in *Studiengang Audiovisuelle Medien, Studieninformation Wintersemester 1990/91* (October 1990).

25   See Dieter Daniels, "Video/Art/Market," in *40yearsvideoart.de — Digital Heritage: Video Art in Germany from 1963 to Today*, eds. Rudolf Frieling and Wulf Herzogenrath (Ostfildern: Hatje Cantz, 2006), 40–49.

26   As another example of publishers discriminating between genres, the *Basic Art* series by Taschen offers these two separate volumes: Sylvia Martin, *Video Art* (2006); Reena Jana and Mark Tribe, *New Media Art* (2006). The four volumes from Thames & Hudson are: Michael Rush, *Video Art* (2003); Christiane Paul, *Digital Art* (2003); Rachel Greene, *Internet Art* (2004); Michael Rush, *New Media in Art* (2005).

27   Kim Cascone, "The Aesthetics of Failure: 'Post-digital' Tendencies in Contemporary Computer Music," *Computer Music Journal* 24, no. 4 (Winter 2000): 12–18.

28   See the complete program note at http://www02.zkm.de/you/index.php?lang=en.

29   See Dieter Daniels, "Das Vermittlungsparadox der Medienkunst: Thesen und Modelle zur multimedialen Vermittlung," in *Die Medien der Kunst – die Kunst der Medien*, eds. Gerhard Johann Lischka and Peter Weibel (Wabern bei Bern: Benteli, 2004), 90–104.

30   See Daniel Langlois Foundation for Art, Science and Technology, http://www.fondation-langlois.org/; final report by Ludwig Boltzmann Institute Media.Art.Research., http://www.hgb-leipzig.de/daniels/LBI-MediaArtResearch-FinalReport.164.pdf, subsequent project website "See This Sound," http://www.see-this-sound.at.

31   The activities of the Daniel Langlois Foundation, privately founded in 1997, were heavily curtailed in 2008, and its collection of original documents on the history of media art was transferred to the Cinémathèque québécoise in 2011. The Ludwig Boltzmann Institute, directed by the author from 2005 to 2009, was closed by the Ludwig Boltzmann Gesellschaft after only four years.

32   As a notable development indicative of increasing institutional awareness as to the importance of archiving and preservation, in April 2016 Rhizome.org received a 600,000-dollar grant from the Andrew W. Mellon Foundation to fund its webrecorder.io dynamic-web archiving tool. transmediale has also received support in recent years for its ongoing archival project, which includes documentation of media art projects it has supported.

33   See "Survival and Maintenance of Media Based Art: an Overview of Existing and Developing Strategies of Documentation/Archiving/Conservation," workshop, Ludwig Boltzmann Institute Media.Art.Research., 2006, see http://www.hgb-leipzig.de/daniels/LBI-MediaArtResearch-FinalReport.164.pdf.

34   In most cases media art institutions do not even sufficiently document their own activities.

35   See an overview of the confusion of "post-media" terminology: Andreas Broeckmann, "'Postmedia' Discourses: A Working Paper," http://www.mikro.in-berlin.de/wiki/tiki-indexphp?page=Postmedia+Discourses. See also Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (2014) http://www.aprja.net/?p=1318.

36   Félix Guattari, "Towards a Post-media Era," in *Provocative Alloys: A Post-media Anthology*, eds. Clemens Apprich et al. (Leuphana: Post-Media Lab & Mute Books, 2013) 27.

37   On the commercialization of video art, see Dieter Daniels, "Video / Art / Market," in *40yearsvideoart.de — Part 1. Digital Heritage: Video Art in Germany from 1963 to the Present* (Ostfildern: Hatje Cantz Verlag, 2006), 40–49.

38   The Berlin Biennale 2016, *The Present in Drag*, curated by the New York–based group DIS, embraced post-contemporary concepts, taking over several topics featured by the transmediale since 2010. See the April 2016 issue of *DIS Magazine*, "Post-contemporary," eds. Armen Avanessian and Suhail Malik, http://dismagazine.com/issues/post-contemporary/; see also Avenessian and Malik, "The Time-Complex. Postcontemporary," *Fear of Content*, IX Berlin Biennale, 2016, http://bb9.berlinbiennale.de/the-time-complex-postcontemporary/.
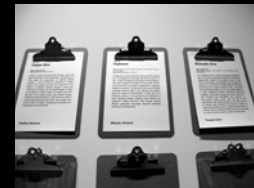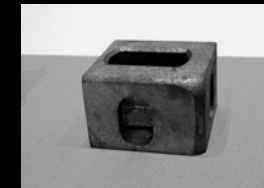


Object 06



Object 25



Object 26



Object 34



Object 38



Object 39
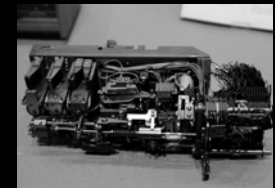


Object 49



Object 52



Object 58

**Evil Media Distribution Center: The Joys of Boredom**

Sometimes it's useful to think about technical objects as having a directive side that, among other things, encourages us to alter our minds, behaviors, and bodies in order to better use them. The directive aspects of technical objects unfold into the objects' yearning for completion by the people, objects, and worlds that use them.

This self-modification in response to objects is often rewarded by allowing us to more clearly tune in to things and receive cleaner channels of information from them. For instance, simply put, the programming and use of computers imply programming the machine in order to perform calculations, regulating the conduct of users in manipulating mice and menu systems, and ordering input to produce desired results. One way to think about how these behavioral logics operate is in the mode of what Michel Foucault described as "discipline," as it entails analyzing and breaking down a phenomenon through modeling it to produce a kind of remote control.

As people participate in the flows of power, languages, and logics created by technical objects, the processes of these objects become normalized and we become entangled in their interrelations across various scales. As we become familiar with how software operates within computation and culture more generally, it makes sense for us to learn how such logics operate in other spheres, such as social process, politics, and economics. The ability to manipulate the directive side of technical objects, the multiple scales of logics, and the thing that is yearning can all be places where the kind of evil described in Matthew Fuller and Andy Goffey's book *Evil Media* resides.[1]

This is an evil YoHa indulges in. We have spent the last few years exploring the directive side of what Fuller and Goffey call "gray media," technical objects that can be thought of as marginal or recessive and that form much of the backdrop and micro-infrastructure of everyday life. In a project called *Invisible Airs*, we explored how gray, relational machines set up a form of governance. We read hundreds of lines of database source code to see how the political processes of transparency were constructed at the technical level, and we also examined how a database's role-based permission structures could create changes in the physical architecture of municipal buildings. This was expressed in the Bristol City Council building, the site of implementation of the conceptual layer of ContactPoint, a national database register of all children at risk of harm in the UK. The database was subsequently withdrawn after the 2010 election but left behind its door-entry systems, its sets of role-based permission structures, and the altered conduct of the people who worked there. Similarly exploring the relationship between the institution as site and as program or protocol, in the project *Database as Documentary* we examined the minutiae of midwives' relationships to database policing, public health, and birth/death records.

In *Coal Fired Computers*, we overtly explored the database as actor. It used relations and entities of UK government records of miners' claims for chronic obstructive pulmonary disease (COPD) and accident reports in order to power an installation that explores the movement of lung disease around the world. The installation —a creative figuration of a disease moving around a globalized world—was manned partly by ex-miners stoking the boiler of a 100-year-old, 12-ton steam engine to generate the electricity to run a single computer, allowing participants to think about the demise of organized labor in the twentieth century, and to problematize its reorganization in the twenty-first so as to avoid such tragedies constantly reoccurring.

There is a necessary dullness to these types of projects, an exploration of boredom that can be isolating. The publication of *Evil Media* led us to want to create a survey or a curiosity cabinet of "evil media" from people whose work we feel has a strong affinity with our projects.

Fuller and Goffey's broad definition of media includes things like middle management, neurotropic or suppressant drugs that treat the body as an information system, queuing systems, and specific algorithms or data structures. Within these media systems, "gray media" produce the working environments of administrators, professionals, and delivery operatives and arrange the movements of everyone from chief executives to intellectuals to cleaners. These media are the background to contemporary society. Using them, getting around their failures, and exploiting their specific qualities forms part of the necessary knowledge of living in the present day. They mediate, transform, encode, filter, and translate relations.

Assisted by transmediale staff, Tom Keene, Anna Blumenkranz, and other members of the Open Systems Association, YoHa invited contributors to write a text of 100 words about an object, its genealogy, and any key factors that make it amenable to manipulation. As mentioned, a key fact of gray media is its quality of dryness bordering on boredom, and this is something we asked people to maintain when writing the texts.

1  Matthew Fuller and Andrew Goffey, *Evil Media* (Cambridge, MA: MIT Press, 2012).

**Matsuko Yokokoji & Graham Harwood
Evil Media Distribution Center**

Object: **06**

# Clipboard

**Date of origin:** Similar objects start to appear in the USA patent record in the late nineteenth century
**Author/inventor/context:** Anonymous

A clipboard is constructed from a flat board with a spring clip. It is designed to hold paper fast and to be hung on a wall. It takes management processes to the workspace. The name "clipboard" emerged in the early twentieth century at the same time as scientific management. A clipboard implies an authority or governance over a set of related processes, allowing data to be collected and passed along the organs of administration. It also acts as a temporary memory in the governance of machines. In some operating systems' Graphics User Interfaces, the "clipboard" creates short-term data storage between different application processes, allowing proprietary software to exchange data.

**Matsuko Yokokoji**

Object: **25**

# ISO Shipping Container Corner

**Date of origin:** 1950
**Author/inventor/context:** Keith W. Tantlinger / Malcolm McLean

Patents for shipping containers with reinforced corners, which McLean made available to the International Organization for Standardization through the issue of a royalty-free lease, enabled shipping of modularized cargo with a considerable reduction in a ship's load and unload time, leading directly to a global decline in the need for long-shoreman. Corner castings (ISO 1161:1984) combined with the Twistlock connector system enabled crane operators to open and close stacked containers automatically at a distance. With the introduction of modularized containers, what had cost around six dollars a ton to load cost only sixteen cents a ton. McLean also invented a way to lift patients from stretchers onto hospital beds, though his opinion of hospital corners is unknown.

**Usman Haque**

Object: **26**

# Photocopier

**Date of origin:** 2003
**Author/inventor/context:** Konica Minolta

The photocopier allows for quick and cheap reproduction of documents and visual material and is widely used in governmental and educational institutions, as well as in businesses. As such, it is quintessential to the principles of ease and efficiency that characterize the postmodern workplace. Operating the machine can, however, imply monotonous work reminiscent of the Industrial Age and is often done by interns and secretaries in spaces that isolate its sound and fumes from the rest of the work-place, manifesting a division of labor thought to have been abolished by the electronic age. In public places, access to photocopiers tends to be limited by a code to prevent excessive use.

**Jacob Lillemose**

Object: **34**

# Modafinil

**Date of origin:** 1970s
**Author/inventor/context:** Michel Jouvet, Lafon Laboratories, France

Initially designed to treat sleep disorders like narcolepsy, idiopathic hypersomnia, sleep apnea and shift work sleep disorder, Modafinil's "off-label" use as a cognitive stimulant and its widespread use by soldiers and students alike make it one of the most popular nootropic (performance-enhancing) drugs purchased from internet pharmacies. The neurochemical substrates of Modafinil are unresolved, but it works by modulating certain monoamine neurotransmitters. Modafinil assists in meeting the requirement to grasp the next window of opportunity, stay alert, be attentive, and memorize more and more sensory data.

**Tony David Sampson**

Object: **38**

# Pallet

**Date of origin:** Second half of Twentieth Century
**Author/inventor/context:** Unknown

Pallets come in many dimensions and forms of construction according to territory, type of load, transport system, standards setting body, and the machinery with which they are handled. They may be made of treated or untreated hard or soft wood as well as of plastics and metals. Deriving from US Navy Logistics technologies from World War Two, they are fundamental to the global modularization of transport and handling. Due to their construction materials, wooden pallets are also able to carry pathogens such as E. coli and to release the chemicals used to cleanse them into the goods they carry, suggesting that in order for something to act predictably as a standard object it requires the constant work of stabilization.

**Matthew Fuller**

Object: **39**

# Paper Shredder

**Date of origin:** 1930s
**Author/inventor/context:** Adolf Ehinger, Germany

The paper shredder was supposedly developed to destroy anti-Nazi materials, and it was modeled on a hand-cranked pasta maker. After the war, institutions started buying the device, and it has figured prominently in scandals such as Iran-Contra and Enron. Shredding is today promoted as a remedy against information fraud, and as such may be grouped among the paranoia-inducing devices that proliferate in information societies. The shredder also testifies to the futility of deletion in the current context: most data can not be destroyed with the aid of a shredder, as it lives on inaccessible machines in unknown locations. When used as a footrest, the shredder may eat your shoelace, returning a modicum of physicality to a screen-centered life.

**Noortje Marres**

Object: **49**

# Random Numbers

**Date of origin:** More than one thousand years ago
**Author/inventor/context:** Unknown

Random numbers are the product of computational mechanisms aiming to generate pattern-less integers (whole numbers with no successive correlation between them) or indeterminate outputs. From the throwing of dice in ancient Sumer and Egypt to the use of yarrow stalks in the I Ching, from the methods of tossing coins to shuffling and picking cards out of hats, from the construction of tables of random numbers since 1927 to computer-generating random sequences or pseudorandom numbers and quantum (or indeterminately) generated random sequences, these computational mechanisms are the generalized operators of economic, political, and social decision-making in our programming culture. As John von Neumann said, "Anyone who considers arithmetical methods of producing random digits is in a state of sin."

**Luciana Parisi**

Object: **52**

# Roomba

**Date of origin:** 2002
**Author/inventor/context:** iRobot

Thirteen inches in diameter, three and a half inches high, the Roomba autonomous vacuum cleaner is equipped with sensors that detect obstacles, dirt, recharging points, airflow, malfunctions, and impassable staircases. A central processing unit controls power to fans, brushes, an audio speaker, motors, and wheels. It employs an algorithmic cleaning pattern that spirals, follows walls and randomly selects direction. If a Roomba gets stuck, humans are instructed to "lift and move Roomba to a new location" by a firm yet comforting female robot voice. Designed to fight dirt and grime, the machines are built by iRobot, one of the largest manufacturers of military robotics in the US.

**Tom Keene**

Object: **58**

# Strowger Automatic Telephone Switch

**Date of origin:** March 10, 1891
**Author/inventor/context:** Almon Brown Strowger

Almon Brown Strowger was born in Penfield, near Rochester, New York. An undertaker by profession, he invented the world's first automatic telephone exchange and, on March 10, 1891, patented a device in which the on-off current is pulsed corresponding to the digits 0–9. The Strowger or step-by-step switch made it possible to call someone directly instead of going through a listening human operator and thus gave rise to the conceptualization of modern telephone networks. Strowger first invented the device to reroute calls from his competitor's wife, who ran the local exchange, putting all the business of the dead through to her husband. His switches were in service until the 1990s, when they were replaced by digital technologies.

**Graham Harwood**
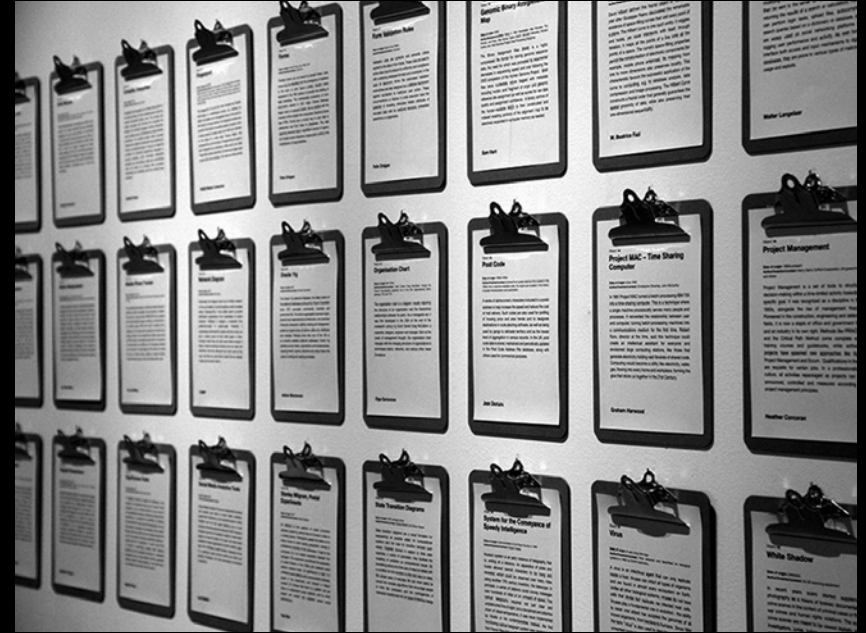
# Jussi Parikka
# The Lab Imaginary: Speculative Practices In Situ [1]

I

If the imaginary did not exist, one would have to invent it. And in so many ways, we have: the imaginary functions as a sort of a reality-producing device that is irreducible to psychological or sociological methods of explanation. In contrast to those explanations, the imaginary becomes a much more interesting entity when considered as a technique with various histories and different institutional situations. In other words, the imaginary is rehearsed and practiced as well as institutionalized across sites, from libraries to laboratories. This is echoed in Michel Foucault's argument that

> the imaginary is not formed in opposition to reality as its denial or compensation; it grows among signs, from book to book, in the interstice of repetitions and commentaries; it is born and takes shape in the interval between books. It is the phenomena of the library. [2]

Foucault, discussing Gustave Flaubert, places the imaginary in relation to a specific media technique of fabulation by way of written words, a seriality of signs that resonates with how he pitches the project of archaeologies of knowledge as the establishment of discursive statements about what can be known and perceived, whether actual or not. In the library, a whole imaginary world can emerge; reading was for a period perceived as such a danger to women that Bovaristic daydreaming was pathologized as an illness of the mind. What other sort of (gendered) illnesses emerge as part of the imaginaries of the library? What other sort of liminal experiences emerge out of media practices that play with boundaries of the actual and the imagined? The list could be long and, besides reading/writing practices, includes other sorts of fabulations about the world: real, unreal, and of times and spaces that can also be reached outside the design interfaces of the book and the library.

**Dr. Jussi Parikka** is a media theorist and Professor at Winchester School of Art, University of Southampton. His books and articles analyze accidents and dark sides of network culture and digital audiovisual culture. Parikka's *Insect Media* book won the 2012 SCMS Anne Friedberg award for Innovative Scholarship. His books include *What Is Media Archaeology?* (2012), *The Anthrobscene* (2014), *A Geology of Media* (2015) and *Writing and Unwriting (Media) Art History* (coedited with Joasia Krysa, 2015).

Imaginaries are often designed to be out of place. They are designed to shift the space of the possible. Both the library and the museum, in different ways, spatially situate the imaginary. But other institutions have also worked and continue to work in similar space-, shape-, and timeshifting manners. [3] This is a shift that also corresponds with the media theoretical narrative of the emergence of technical media: "Once memories and dreams, the dead and ghosts, become technically reproducible, readers and writers no longer need the powers of hallucination. Our realm of the dead has withdrawn from the books in which it resided for so long." [4] The studio would be another obvious contender as a site of the imaginary, but in relation to technical media culture I will focus on another related site that has gained ground again in the past years in art and design: the laboratory. I will address the laboratory as such a place incorporating practices that shift the coordinates of what is possible. The lab has a significant cultural history, both as a real and a fictional site of scientific research that has become much more than the actual practices of experiments and knowledge production: the mythology of the laboratory is itself a trope that escapes from the confines of any "real history" of what laboratories are. In addition, in recent years an increasing amount of humanities and media institutions have pitched themselves as "labs" in design, creativity, and even a sort of imaginary work, or at least a media archaeological sort of reverse-engineering of technologies and cultural narratives about technology. Bureau D'Etudes speaks of a "Laboratory Planet," which, besides designating the twenty- and twenty-first-century science-military-entertainment-university-complex as the defining planetary situation that installs infrastructures of power and technology, also refers to the laboratorization of knowledge. [5] The world's a lab, or at least that's how the rhetoric justifies contemporary smart cities, university institutions, and hack labs. [6]

In this context I ask the question: Outside of the library, as the site of daydreaming fabulation and the situated, written-form imaginary, how do we engage in practices of speculation in media and design labs, which are contemporary places of recreation, imagination, technological practice, and activism? [7]

Such a question is rather large to be resolved in a short article, as it touches on the assumed tensions between regularity versus unexpected outcomes; experimentation versus standardization; creativity versus routine, and other sorts of assumed polar opposites that form the ways in which scientific and artistic activity is seen to be separated. And yet, in order to avoid such stereotypes about knowledge and creative practices, critical maps of laboratory practices are needed. Such critical maps, genealogies, and investigations are reminiscent of the various ways in which twentieth-century art and design education's laboratorization of the experiment, as well as the "post-studio practice" interest in other spaces and sites of creativity, have offered ways to understand how institutional situations go hand-in-hand with the broad field of creative practice.

The speculative stance that has become part of the media and design lab scene has often assumed future-oriented and progressivist tones ("Inventing the Future," as the MIT Media Lab has been proposing since the 1980s), but I am just as interested in another sort of temporal horizon: inventing the past as well as inventing alternative timescales, or imaginaries of time-shifting. Hence the lab becomes perceived as a place of experimentation with alternative temporalities, where a politics of time in post-digital culture emerges.[8]

II

The laboratory has institutionalized itself as a key place of invention. As Alfred N. Whitehead put it early in the twentieth century, it is not only isolated technologies like the steam engine that define the special advanced nature of modernity but the method itself:

> The greatest invention of the nineteenth century was the invention of the method of invention. A new method entered into life. In order to understand our epoch, we can neglect all the details of change, such as railways, telegraphs, radios, spinning machines, synthetic dyes. We must concentrate on the method itself; that is the real novelty, which has broken up the foundations of the old civilisation.[9]

Whitehead shifts the focus from considering science as a purely cognitive contemplation of new ideas to something akin to a mine or geological investigation of ideas that deals with more than just scientific statements and propositions. Also, "an intense period of imaginative design" is needed for ideas to become products, Whitehead continues, sounding more like a prototypical design thinker than a process philosopher.[10] Such techniques also include the institutionalization of specific places as part of the emergence of research universities and other places of experimental work.[11] Laboratories became standardized as one core feature of chemical and physical science activity, but also engineering work: the Menlo Park laboratories led by Thomas A. Edison were the much debated hub of creative engineering and business ventures, while the laboratory of Nikola Tesla became a parallel sort of a mythologized place of the lone (male) creator of technological marvels.[12] The method of invention was also a site of invention that resonated with the parallel spaces of the studio (as in artistic creativity) and the seminar/library (as in the humanities) but with a distinct set of experimental heritage that it carried with it.

Edison was a symptomatic figure, managing to be both an idealized lone genius and also be supported by the collective of experts and facilities at Menlo Park since 1876. Even before Menlo Park, Edison was very acutely aware of what he needed for his early version of a media lab, calling for "every conceivable variety of Electric Apparatus, and any quantity of Chemicals for experimentation."[13] However, it was surely not only the kit or the experimental setup that defined the emerging tech lab, but the new forms of management that defined the emerging methods of science-cum-engineering-cum-media reality of the twentieth century.[14]

Bruno Latour has written of the effective power of the laboratory as a site of shifting scales. The gradual turn in the understanding of science as a situated practice where the experiment is itself also part of a variety of social considerations forms a particular situation of trial and error, containment and distribution. As Latour outlines, the power of the lab resides in its possibilities as a place of trial and error that gathers its special powers of scale from the interface with the outside world.

He discusses the role of the lab in Louis Pasteur's nineteenth-century microbe farming and its massive social consequences as related to its spatial properties, which are about controlling the practices of temporality and recursion. Indeed, the powers of the lab reside "in the special construction of laboratories in a manner which reverses the scale of phenomena so as to make things readable, and then accelerates the frequency of trials, allowing many mistakes to be made and registered."[15]

It is clear that Latour's discussion is specific to the particular situations of that scientific practice and its relevance for issues of health, farms, animals, and more: a whole bundle of material and narrative factors emerge. But some of his perceptions facilitate thinking through a wide range of other lab practices as well, from the early technology and innovation laboratories to more recent versions of media and design labs. Indeed, as Latour elaborates, that laboratory's seeming containment is only relative, and "another reason why the inside/outside notion is irrelevant, is that in this example the laboratory positions itself precisely so as to reproduce inside its walls an event that seems to be happening only outside," emphasizing the lab as a scalar displacement of a lot of issues debated on other levels.[16]

The particular narrative tropes and material experiments in the nineteenth and early twentieth-century already involved massive back-and-forth scalar operations. Not only facts were discovered or produced, but also other sorts of side products, including, for example, visions of the future that permeated the nineteenth century, as well as parapsychological realities measured in a lab, coated with the authority of the white garment worn by the specialist. A bundle of things emerged and spread, and became the add-on to the experimental product itself.

It is safe to say that the institutionalization of labs (from Bell Labs to Silicon Valley design labs, from Palo Alto PARC to various forms of MIT institutions, to the hack lab and creative lab scenes in Europe of the 1980s and 1990s) became crucial for the understanding of what we refer to as "media innovation." The massive financial investment in many forms of labs, especially in the US, was paralleled by the massive hyperbolic rhetoric that some of the places gained with their products.

But they also produced practices and phrases with material impact across a cultural field. As John Beck and Ryan Bishop argue, the 1960s wave of Art and Tech labs was characterized by a future-oriented optimism: "the New Frontier, a world of the future that left behind the traumas of the recent past (the Depression, World War II) and cast an unblinking eye on the horizon ahead."[17] At the MIT Media Lab this was still later present in the central mantra "Inventing the Future," which, as Lori Emerson reminds, was a continuation of a particular sort of a humanism-future of an elite institution:

> This particular brand of humanism is always tied to an imaginary future, it's a particular kind of inhuman humanism that began in the Arch Mach group and went on to flourish in the Media lab — it's one that constantly invokes an imagined future human that doesn't really exist partly because it's part of an ever-receding future but also because this imagined future human is only ever a privileged, highly individualized, boundary-policing, disembodied, white, western male human.[18]

Imaginaries are always caught in a web of political and economic conditions. Discourses of invention of the future as lab activity and the actual (admittedly often influential) work are expressions of normalized corporate interest in the untimely, the impossible, and fabulated dream worlds.[19] Hence, as an alternative I want to turn to some other situated practices of the imaginary as well as other sorts of media archaeology as ways to not only offer critical design and reverse-engineering, but as ways to pitch the lab's scalar effect as an invention of a different sort of a temporal horizon that orients toward the past. An invention of a technology (new or existing) is always an invention of a particular temporality.[20]

III

"How do you prototype the past?" is a question that has emerged as a guiding thread at the Maker Lab in the Humanities (MLab) at the University of Victoria. Led by Jentery Sayers,

transmediale 2014 afterglow Uses and Abuses of Big Data, Conference, 31.01.2014 / The Media of the Earth: Geologies of Flesh and the Earth, Conference, 01.02.2014
transmediale 2013 BWPWAP Digital Memory and the Archive & What is Media Archaeology?, Conference, 01.02 2013 / Back When Pluto Was Another Cold War Heavenly
Body: Militarisation, Media and Space, Conference, 02.02.2013 / Sources Synths Circuits: The Instrumentarium of Prof. Kittler, Conference, 02.02.2013

the lab is happily involved in the sort of a media archaeological stylistics that have become prevalent in many media theoretical writings and alternative histories. Sayers and Tiffany Chan talk about their lab as a site of media theory and design methodologies:

> Technologies that no longer exist or function like they once did. The technologies we prototype are dated anywhere between the 1850s and 1950s, which give us a sense of media history prior to personal computing but after early feedback control and related mechanics. These prototypes usually inform present-day technologies—wearables, cloud computing, and optical character recognition, for example—by giving them a sense of texture and change.[21]

As a sort of an inverted speculative design that focuses on the past, this approach resonates with Garnet Hertz's idea of the past as a storehouse for invention.[22] Yet it is clear that this is not imaginary media in the completely fabulated sense, even if it is explicitly interested in "absences in the historical record."[23] The institutionalized lab practice continues the maker-discourse by way of a practice-based history that picks up on established design technologies and techniques while also developing new ones like "the kit." A key part of the lab's design methodology (both conceptual and related to techniques of digital fabrication) are the "Kits for Cultural History," explained as a specific design/humanities approach to research:

> Rather than communicating humanities research solely in a written format, these open-source kits encourage hands-on, exploratory engagements that playfully resist instrumentalism as well as determinism. In so doing, they prompt audiences to consider how the material particulars of historical mechanisms are embedded in culture, without assuming that, in the present, we can ever experience the world like "they did back then."[24]

The kit becomes both a prop and a conceptual device more than an artifact. Its container is a sort of academic version of

a Fluxkit, referring back to the projects of Fluxus. One kit, the "Early Wearable Technologies Kit," is a wooden jewellery box containing prototypes of Victorian electro-mobile wearables. In this type of kit, media history becomes tactile.[25] Another way to put this would be to say that the artifact or the product is itself a sort of a device for problematizing what is taken as "actual" past and the possible imaginaries around a particular technology or historical situation. It becomes a sort of a disjuncture on a time-axis and works to enrich the sense of the contemporary as an overlapping set of temporal layers. It is embedded in a rich world of considerations about the social relations and imaginaries that are stretched between actual pasts and potential presents, offering a disjuncture of temporal relations that should not be thought of only in the past-present-future directional sense. It is the playful resistance of the kit—a theme that resonates with what Geert Lovink called "against the grain" that produces an interesting rupture in too-easily taken-for-granted epistemologies of media time.[26] The spatial affordance of the lab becomes such a rupture, and the institutional form of the lab becomes an affordance for a different sort of a temporality than "inventing the future."

An interesting version of a laboratory has been developed at the Berlin Humboldt University's Media Archaeological Fundus and the Signal Laboratory. Berlin is rich in other media historical sites, such as the project Atlas of MediaThinking and MediaActing, a cartography of media theory and practice. Site-specificity is similarly part of the appeal of the Fundus and the Signal Lab, but with a time-machine sort of approach. The Fundus is tightly premised around the theoretical work of Wolfgang Ernst, and itself a sort of a mix of collection, depo, and lab with a strong hands-on imperative. The sister space, the Signal Lab, is a related project that pushes teaching of media further from the texts of media theory to "teaching electronics, programming, and topics of the informatics/computer sciences from the viewpoint of media theory," as Stefan Höltgen puts it.[27] This relates to the primacy of signal—the signal as the "object" of such analysis, or what Ernst emphasizes as the operational aspect of media: media are primarily

media only when in operation, and when in operation, technical media function as time-critical devices.

The various object collections are not meant as collections in the archival sense. They are meant to be touched, investigated, they are not organized in an archival order but as laboratory experiments with a historical quality to them. The list of object-oddities would be long—from the familiar (Commodore 64s being the main feature of a recent intensive workshop/course at the Signal Laboratory) to the less obviously media-related, like the technical instruments in the Fundus including oscilloscopes and many other measurement devices. The spaces invert our usual sense of "Digital Humanities" focused on emerging techniques and data, reverse-engineering the functions of hardware. The objects are then lab apparatuses that fabricate ways to think of time: not so much the imaginary histories, but the ways in which specific techniques sustain our notions of time.

So these sorts of labs become stages for experiments and observation of time and the time-critical signal. As abstract as it sounds, this works in rather concrete terms of analysis. Ernst explains that "the essence of technical media is only evident in their operation implementation," which is to be understood through notions of time that should be further complicated in situations of analysis: "It is thus appropriate to employ concepts that do not always already bind technically signifying time figures to a transcendental signified and burden them with an imaginary called history."[28]

In a curious twist as to the presence of lab cultures, what were new media labs some 100 years ago (including Menlo Park and others) would now be called media archaeology and other alternative media labs that engage with zombie media or speculative design of past media cultures. The novel technological objects of the late-nineteenth and early-twentieth centuries now become entry points to alternative sorts of approaches that partly feed into the charm and exoticism of old media. This also applies to film. Current film labs and other artist-run collectives are places of sharing both specific technical expertise and a sense of community around a "what's-not-yet-dead" sort of a spirit.[29] This even applies to seemingly very techni-

cal labs reminiscent of the (photo)chemical roots of modern technical media in their alternative lab practice. The Process Reversal Lab in the US is dedicated to being such an artistic "photochemical initiative" that, by way of a focused look at color film stock from earlier film cultures, also opens up a wider conceptual agenda as to what a technical-chemistry lab can be in the context of the imaginary:

> In a time of discontinued film stocks, disenfranchised cinemas and abandoned film laboratories, the prospect of filmmaking can appear intimidating […] as well as exciting—for while the film industry collapses all around us, we are being left with a unique opportunity; a chance to reinvent the medium in an image that was neither intended nor desired by its capitalist exploiters; one that explores new ways of seeing, new ways of hearing, and new ways of speaking about film.[30]

It would be tempting to look at such examples as proof of laboratory fever as a nostalgic drive toward resuscitating what has been lost and made irrelevant given the massive data-driven planetary-scale computational culture: an attachment to knowledge and retro sort of DIY culture surrounding rather obsolete things. But I would claim that it is also a much more interesting sort of practice as it deals with speculative pasts by way of technical knowledge, making interventions into technical practice in ways that are not reducible only to the digital. This becomes part of the temporal agenda of the lab, a theme that will be addressed in the next, final section.

IV

Any discourse interested in speculative futures, alternative pasts, past futures, future pasts, and other sorts of contributions to the imaginary can also be confronted with questions about the spaces and situations in which imaginaries can happen.[31] Developing such theoretical and methodological positions, we might even speak of location-specific theory that could be seen as a version of Peter Galison's call for specific

theory that moves away from universalistic assumptions and also from narrow empiricism. As Rosi Braidotti suggests, this sort of specificity can frame a mixture of grounded, accountable, shareable, and open scholarly work.32

The lab, then, is one way to consider the situated nature of an institutional set-up. One particularly interesting aspect is how in some of the examples discussed, the site becomes both a hands-on design space and reverse-engineering space, which extends the idea of the imaginary from fabulation to other sorts of critical methodologies close to media archaeology too. And this sort of an extension is a way to intervene and invent new ways to deal with time that contributes to media theory and also to the debates about the post-digital as a particular way to approach media cultural time. It is important to ask about "the political anthropology of new institutional forms" while also acknowledging that an analysis of institutional situations can move beyond the merely human experienced.33 Such a speculative design brief is also something that in these cases can be expanded to consider the other-times that are born in situations of critical labs in design and media archaeology: the time-critical technical media analyzed in the Signal Laboratory and the Media Archaeological Fundus that look at micro-temporalities that form a different level of manipulation of the time-axis than something that is returnable to the level of human perception.34 And this also involves the development of such technological critical practices that enable consideration of the linear time models of past-now-future as insufficient to understand the work of labs.

Geoff Cox has pointed to the politics of temporality in discussions about the post-digital, something that becomes relevant in the context of this text too. The notion of the post-digital is acknowledged as one way to discuss the asynchronous nature of contemporary media culture, which forces one to consider such temporal markers as "new" or "old" as inadequate.35 However, Cox flags that notions such as the post-digital also work as "periodizing concepts" which can actually hinder some of their critical potential.36 He continues by way of a discussion of the contemporary as a complementary concept that facilitates the development of sufficiently

complex temporal forms that speak to practices and theory in contemporary art to media culture.

Besides the development of discursive insights to the axis of contemporary art and media, we should also consider in which spaces such a development happens. In this text, the lab is suggested as one such a situation, although we have to recognize that the variety of "labs" makes it impossible to make any generalizations: the "inventing the future" sort of corporate brand of MIT Media Lab differs rather radically from these small-scale examples that could be even called the "locavore"37 humanities labs of our era, and they differ from the emergence of labs in rather different geopolitical locations such as the maker-lab ecosystems emerging in West Africa, for example in Agbogbloshie, Ghana, one of the hubs of e-waste dumping. The Agbogbloshie Makerspace Platform sounds at first like any maker lab/space, with its aims of collective work, community, and prototyping: "to join hands to prototype tools and co-create a hybrid digital-physical platform for recycling, making, sharing and trading."38 However, the material reality and infrastructure presents a different angle. The lab is placed in a second-order material reality of used things, which emerges out of necessity more than out of mere theoretical interest. But it is also a different geopolitical context in terms of electronic culture—another aspect that underlines the necessity to think of a politics of time in the post-digital culture as crucial entry point. We can consider this a geographical shift away from the usual narratives of US and European locations of invention to an alternative geopolitical angle. From the shift of the time-axis of R&D labs as inventions of the future to current labs aiming to invent pasts and alternative ways to engage with the now, the issue of labs becomes one way to frame imaginaries of media and design as situated practices.

1   This chapter emerges from the collective research project *What Is a Media Lab* that I am engaged in together with Lori Emerson and Darren Wershler. Please see www.whatisamedialab.com for more information.

2   Michel Foucault, "Afterword to the Temptation of St. Anthony," in *Aesthetics, Method and Epistemology*, ed. James. D Faubion (New York: New Press, 1998), 106.

3   To quote Gilles Deleuze, "the institution is always given as an organized system of means [...] law is a limitation of actions, institution a positive model for action." Gilles Deleuze, "Instincts and Institutions," *Desert Islands and Other Texts 1953–1974* (Los Angeles: Semiotext(e), 2004), 19.

4    Friedrich Kittler, *Gramophone, Film, Typewriter*, trans. Geoffrey Winthrop-Young and Michael Wutz (Stanford: Stanford University Press, 1999), 10.

5    Ryan Bishop, "The Global University," *Theory, Culture & Society* 23, nos. 2–3 (2006): 563–66.

6    Bureau D'Etudes speaks of the planetary lab: "Since World War, the planet is gradually transformed into a scale 1 laboratory. The old model of "world factory" has given way to the model of the "world laboratory." Objects of this laboratory, can we also be the subjects? Can we reclaim this huge machine that became autonomous and is now developing according to its own dynamic? Can we redirect the fate and direction of this laboratory?" Quoted on the Laboratory Planet website: http://laboratory planet.org/en/.

7    There are plenty of relevant examples, but in terms of recent activism where the rhetoric of the lab is mobilized as a feminist network, Deep Lab is a project that maps issues across activism, art, design, and internet culture: http://topicalcream.info/editorial/deep-lab-2/ (accessed September 20, 2016). It is also a good example of the ways in which the notion of the lab is not necessarily contained by normal architectural arrangements, but becomes a network of participants working on a wider geographical scale and with wider set of global social issues.

8    Geoff Cox, "The Post-digital and the Problem of Temporality," in *Postdigital Aesthetics: Art, Computation and Design*, eds. David M. Berry and Michael Dieter (Basingstoke: Palgrave, 2015), 151–62.

9    Alfred North Whitehead, *Science and the Modern World* (New York: New American Library 1925), 91.

10   Ibid., 92.

11   See William Clark, *Academic Charisma and the Origins of the Research University* (Chicago and London: University of Chicago Press, 2006); Catherine M. Jackson, "Chemistry as the defining science: discipline and training in nineteenth-century chemical laboratories," *Endeavour* 35, nos. 2–3 (2011): 55–62.

12   Peter Galison and Caroline A. Jones, "Factory, Laboratory, Studio: Dispersing Sites of Production," in *The Architecture of Science*, eds. Peter Galison and Emily Thompson (Cambridge, MA: MIT Press, 1999), 497–540.

13   Edison's letter to Charles E. Buell, December 1, 1873, quoted in Paul Israel, "Telegraphy and Edison's Invention Factory," in *Working at Inventing: Thomas A. Edison and the Menlo Park Experience*, ed. William S. Pretzer (Baltimore: Johns Hopkins University Press, 2002), 69.

14   "Undergirding this new context was an emerging corporate culture that relied less on the invisible hand of the market and more on what historian Alfred Chandler has called the 'visible hand' of modern management." Paul Israel, "Telegraphy and Edison's Invention Factory," 66.

15   Bruno Latour, "Give Me a Laboratory and I Will Raise the World," *Science Observed: Perspectives on the Social Study of Science*, eds. Karin Knorr-Cetina and Michael Mulkay (London: Sage, 1983), 165.

16   Ibid., 154.

17   John Beck and Ryan Bishop, "The Return of the Art and Tech Lab," article manuscript, April 2016.

18   Lori Emerson, "Selling the Future at the MIT Media Lab," lecture, transmediale, February 2016, Berlin, http://whatisamedialab.com/2016/02/17/selling-the-future-at-the-mit-media-lab/.

19   See Siegfried Zielinski, "Modelling Media for Ignatius Loyola: A Case Study on Athanius Kircher's World of Apparatus between the Imaginary and the Real," *The Book of Imaginary Media: Excavating the Dream of the Ultimate Communication Medium*, ed. Eric Kluitenberg (Amsterdam: debalie & NAi Publishers, 2006), 28–55; Eric Kluitenberg, "On the Archaeology of Imaginary Media," *Media Archaeology: Approaches, Applications and Implications*, eds. Erkki Huhtamo and Jussi Parikka (Berkeley, CA: University of California Press, 2011), 48–69.

20   Wolfgang Ernst (2013) speaks of the *Eigenzeit* of media technology.

21   Darren Wershler, interview with Jentery Sayers and Tiffany Chan, "Prototyping the Past: The Maker Lab in the Humanities at the University of Victoria," *What Is a Media Lab* project website, May 10, 2016, http://whatisamedialab.com/2016/05/10/prototyping-the-past-the-maker-lab-in-the-humanities-at-the-university-of-victoria/.

22   See Garnet Hertz, "Dead Media Research Lab," website, 2009, http://www.conceptlab.com/deadmedia/.

23   Jentery Sayers, "Prototyping the Past," *Visible Language* 49, no. 3 (December 2015), http://visiblelanguagejournal.com/issue/172/article/1232.

24   Nina Belojevic, "Kits for Cultural History," *Maker Lab in the Humanities*, September 20, 2014, http://maker.uvic.ca/kch/#sthash.zd1Z4n21.dpuf. The "kit" also resonates strongly with some methods in critical design, like cultural probes, props, and scenarios. See Anthony Dunne, *Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design* (Cambridge, MA: MIT Press, 2005).

25   Jentery Sayers, "Kits for Cultural History: A Critical Essay," *Hyperrhiz* 13 (Fall 2015), http://hyperrhiz.io/hyperrhiz13/workshops-kits/early-wearables-essay.html.

26   Geert Lovink, *My First Recession: Critical Internet Cultures in Transition* (Rotterdam: NAi Publishers, 2004), 11.

27   Interview with Stefan Höltgen, May 4, 2015.

28   Wolfgang Ernst, *Chronopoetics: The Temporal Being and Operativity of Technological Media*, trans. Anthony Enns (London: Rowman & Littlefield, 2016), 205. See also Wolfgang Ernst, *Sonic Time Machines* (Amsterdam: Amsterdam University Press, 2016).

29   Good examples include the LaborBerlin film lab with its motto "film ain't dead" as well as a range of other European and other examples, such as Filmwerkplaats (Rotterdam, the Netherlands), Átomo 47 (Portugal), and the Filmkoop Wien (Austria). See Elena Duque, "Celluloid and Self-Sufficiency: Artist-Run Labs," *CCCB Lab, Research and Innovation in the Cultural Sphere*, February 23, 2016, http://blogs.cccb.org/lab/en/article_cel%C2%B7luloide-i-autosuficiencia-laboratoris-autogestionats-per-artistes/.

30   "Process Reversal," *Process Reversal Lab* website, http://processreversal.org/. See also Duque, "Celluloid and Self-Sufficiency: Artist-Run Labs."

31   See Benjamin H. Bratton, "On Speculative Design," *DIS Magazine*, May 2016, http://dismagazine.com/discussion/81971/on-speculative-design-benjamin-h-bratton/; *Media Archaeology: Approaches, Applications and Implications*, eds. Erkki Huhtamo and Jussi Parikka (Berkeley: University of California Press, 2011); Richard Barbrook, *Imaginary Futures: From Thinking Machines to the Global Village* (London: Pluto, 2007); Reinhart Koselleck, *Futures Past: On the Semantics of Historical Time*, trans. Keith Tribe (New York: Columbia University Press, 2004).

32   Rosi Braidotti, *The Posthuman* (Cambridge: Polity, 2012), 157.

33   Brett Neilson and Ned Rossiter, "Towards a Political Anthropology of New Institutional Forms," *Ephemera* 6, no. 4 (2006): 393–410.

34   See also Bratton, "On Speculative Design."

35   Cox, "The Post-digital and the Problem of Temporality," 151; see also Florian Cramer, "What Is 'Post-digital,'" in *Postdigital Aesthetics: Art Computation, and Design*, eds. David M. Berry and Michael Dieter (Basingstoke: Palgrave, 2015), 12–26.

36   Ibid., 154.

37   Lori Emerson, "The Archaeological Media Lab as a Locavore Thinking Device," May 12, 2011, https://loriemerson.net/2011/05/12/archeological-media-lab-as-locavore-thinking-device/ (accessed May 27, 2016).

38   The Agbogbloshie Makerspace Platform (AMP) website, https://qamp.net/project/ (accessed May 27, 2016).

The future was then. For the twenty-sixth edition of transmediale, "Back when Pluto was a Planet" Telekommunisten were approached by Kristoffer Gansing and Tatiana Bazzichelli with the opportunity to retrieve and recontextualize a robust and ingenious communication technology that had long been close to our hearts: pneumatic post. Berlin had one of the most extensive metropolitan pneumatic systems, called the *Rohrpost*, or "tube-mail." Inaugurated on November 18, 1865, it had become a network of over 400 kilometers by its heyday in 1940, delivering over eight million envelopes a year. Disrupted by the division of the city and the introduction of commercial telex, the system was phased out in both the East and West by 1986. What a waste of a perfectly functional communication platform!

True to the spirit of the heady tech start-up scene in Berlin, Telekommunisten launched the OCTO Corporation in 2012, which publicly promised to reclaim the *Rohrpost* from oblivion and transform it into a paradigm-breaking new start-up opportunity. Sure, the internet was great and all, but it was seriously lacking that special touch: "physicality." With the motto "the future is physical," OCTO appered at transmediale to unveil and demonstrate a prototype of its twenty-first century pneumatic post system: the OCTO P7C-1. Jonas Frankki provided the visual identity for the corporate website, which promised to richly reward early investors.

The installation *OCTO P7C-1* was performed on two layers: the fictional OCTO company, which wanted to put Amazon out of business with direct delivery of physical goods, and the actual functioning installation with a modernist central station designed by Jeff Mann in the HKW lobby, radiating tubes to "end-stations" throughout the entire building. Beaming with pride over the revolutionarily re-vived technology, Diani Barreto took the stage as "Octavia Allende Friedman," CEO of the OCTO Corporation, at the opening of the festival to enthuse the hundreds of potential investors in the crowd. Kristoffer Gansing later demonstrated the power of the OCTO P7C-1, using it at a key moment in the proceedings to deliver the result of a referendum on the planet status of Pluto.

OCTO P7C-1 was the Official Miscommunication Platform of transmediale that year, showcasing the capacity for vacuum-speed delivery of capsules up to 500 grams to and from any of its eight end-stations. The end-stations were connected to the central station by about a kilometer of DIN 80 yellow plastic drainage pipe, and the whole prototype system was powered by only two household vacuum clea-ners. Of course, for quality assurance and for security reasons the P7C-1 system was completely centralized. To send a message one had to contact the central station to send an empty capsule and then inform the central station where the capsule was to go. At the central station there was a continuous improvised "labor theater" performance as our diligent crew learned on the job how to channel capsules, deal with customers, and check capsules for contraband and politically sensitive contents.

Use of the system was purposefully complicated, with every capsule having to be sent through a central coordinating station at the mercy of the operators. P7C-1's cumbersome, labor-intensive, and privacy-antagonistic actuality flew in the face of the transcendent promises unflaggingly issued from the fictional director-ship of the OCTO company. Unlike the internet, where the physical labor is hidden, the labor behind OCTO P7C-1 is presented as a central theatrical aspect of the work. The social fiction layer of the installation, the OCTO Corporation, constantly drove home the lesson that there is a price for the convenience of every new technological utopia under capitalism, and the price will be extracted from those who are promised they will benefit from it.

General concern regarding the censorship and surveillance of commercial on-line platforms is growing. These features are not unintended side effects of these platforms, but rather are central to their business models, and platforms that do not surveil or control cannot and will not be financed by capital, but only by collec-tive or public undertakings with priorities that diverge from capitalism. Once this becomes clearer, concern over the privacy settings on Facebook can be directed toward capitalism itself, instead of the idiosyncrasies of that platform or its founders.

As one of Telekommunisten's *Miscommunication Technologies* series of artworks, OCTO illustrates some of the real-world challenges faced by anyone or any group that would like to challenge the dominance of capitalist models of pro-duction. The *Miscommunication Technologies* take a light-hearted approach to an intractable reality: capitalism is not only the system by which maximum value is extracted from social production; it is also the current global system that, in its un-satisfactory yet somewhat reliable manner, provides vital services we depend on every day. Any challenge to capitalist hegemony must be prepared to provide for the same social needs, which will persist in any system.

Great ideas and innovative solutions alone will not be able to emancipate users from capitalist exploitation unless accompanied by alternative financing models. Alternative business models, which resist capitalism on the platform level, addition-ally require "counter-politics," broad heterdox social militancy, to protect the space of alternative practices so they can scale to the degree that they can replace the prevalent monopolistic, centralized models like Facebook or Google. The development of communications technologies is not merely a neutral process driven by dis-covery, progress, and innovation; it is also an intensely social and political process, where choices are made in ways that fundamentally influence the reproduction of the class conditions of the societies that produce these technologies. Communications technologies embody and perpetuate the social relations of their mode of production.

**Baruch Gottlieb** is a Canada-born media artist exploring navigable fiction and documentary and an active member of the Telekommunisten Network. His work's focus is the industrialization of the subject of industrially produced media. He is currently artist-researcher-in-residence at the Institute of Time-Based Media at the University of Arts, Berlin. *His book Gratitude for Technology* (2009) explores the persistent materiality of the digital image.

**Dmytri Kleiner** is a software developer and the author of *The Telekommunist Manifesto.* He is a contributing artist to the *Miscommunication Technologies* continuing series of artworks by Telekommunisten, with works such as *deadSwap, Thimbl, R15N,* and *OCTO.* In *The Telekommunist Manifesto,* Kleiner published the Peer-Production license, a commons-friendly license the author has described as CopyFarLeft, and proposed Venture Communism, a mode of worker-controlled production modeled on peer networks and the pastoral commons.

# Baruch Gottlieb & Dmytri Kleiner
## OCTO C7P-1

transmediale/conversationpiece Artwork: *whitesave.me* / Panic Room Session: Imbalanced Technology, Talk, 04.02.2016 / McLuminations: Global Village Anxiety, Talk, 06.02.2016 **transmediale 2015 CAPTURE ALL** Artwork: *deadSwap 2.0* / Clandestine Offline Sharing Networks, Workshop, 30.01.2015 **transmediale 2014 afterglow** McLuminations 14:1 Counter-Environment Infrastructures and Substrata of the Global Village, Conference, 01.02.2014 **transmediale 2013 BWPWAP** Imaginary Museums, Computationality & the New Aesthetic,

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**transmediale 2k+12 in/compatible** Artwork: *R15N* / *R15N* Presentation, Talk, 31.01.2012 / resource Opening, Talk, 31.01.2012 / resource Launch—Zombie Play in the Ludic Salon: Resourcing an Exquisite Media Corpse, Talk, 05.02.2012 / *R15N* & Technologies of Miscommunication, Workshop, 03.02.2012 **transmediale11. RESPONSE:ABILITY** thimble by and with Dmytri Kleiner, Workshop, 02.02.2011 / The Currency of the Commons—The Price and Value of Free Culture, Talk, 05.02.2011
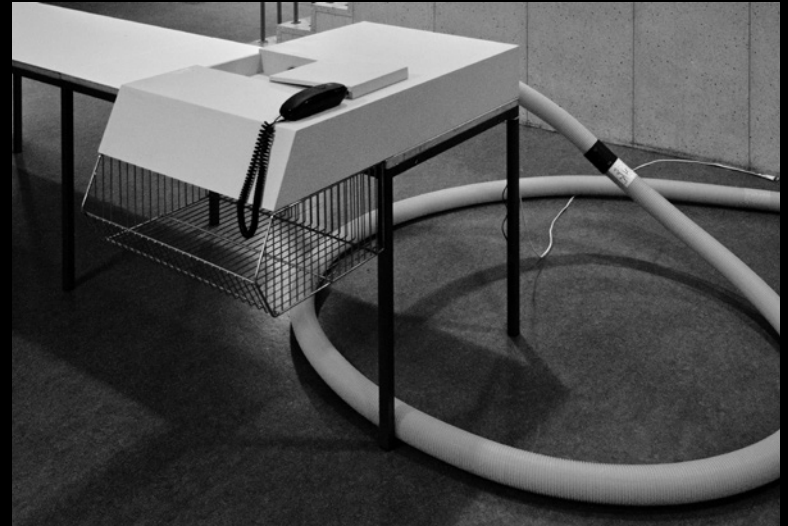
transmediale.11 RESPONSE:ABILITY Global Village Idiots: A Speculative Encounter Between Marshall McLuhan and Vilém Flusser, Screening, 05.02.2011
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Price and Value of Cultural Work,
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# Alessandro Ludovico
# The Touching Charm of Print

Printed media have a historically consolidated visual infrastructure, refined through centuries of visual culture. The visual aspect of print has been considered absolutely predominant compared to the involvement of the other senses of smell, hearing, and touch, and in our oculocentric society, this part has been progressively (and wrongly) perceived to coincide with its whole. This seems to be the main reason why printed media have recently started to be massively translated into another medium (the digital) through a direct process. Since print is supposedly perceived mainly visually, it is reduced through the scanning and circulation of digital files and their digital-only production into specific formats. The resulting sense of loss stems from much more than nostalgia: what is missing is an entire small perceptual universe that is instinctually unfolded every time the physical printed medium is used, which is altered, if not negated, in its new screen-based embodiment. An analysis of the perceptual dimensions of print, sense-by-sense (excluding taste, for obvious reasons), is then a premise for understanding not only the intrinsic "tactility" of data, but especially what we can tentatively define as the "material space of information" and the direct consequences it can have on publishing.

## THE DIGITAL READING EXPERIENCE

> A theory of cultural change is impossible without knowledge of the changing sense ratios affected by various externalizations of our senses.
> —Marshall McLuhan[1]

The general discourse about digital forms of print focuses primarily on the extreme flexibility of the digital, derived from its "computability." Since information is processed each time it's visualized, a digital publication can be carried around in infinitely small digital storage space and can be accessed in various different ways. These modes of access include precise

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and composite search queries, quantification of a text's literary characteristics, and links to external content that may also cross-reference the original text. But all these instant, accessible qualities of the digital come at a price, one which is constantly underestimated: a completely different "reading experience" compared to the models derived from print culture, especially when considered from a perceptual perspective.[2]

We can assume that digital content requires primarily one sense: sight, which will be analyzed later. Let's start instead by considering smell, which is almost completely absent in digital media, if we exclude the smell of the hardware, initially present when the reading device is very new, due to the first heating of plastic and electronics, but which vanishes rapidly as time passes. Science fiction author Ray Bradbury famously affirmed that reading devices "smell like burned fuel," perhaps literally but also metaphorically referring to their artificial nature.[3] Remarkably, even if there were some odor associated with the device, it would always be the same one associated with every single digital publication, breaking the strong connection that our senses make between a specific content/publication and a specific smell. This is part of the digitization process. The collapsing of content space into one single device flattens the singular physical qualities, intensifying mostly the visual ones.

To compensate for the absence of smell, there are companies trying to synthesize odors to, within a broader commercial aim, produce "expanded digital books." Vapour Communication has built a prototype "oBook," a "Goldilocks and the Three Bears" e-book that incorporates different synthetic smells such as flowers, berries, and hot chocolate. At certain points in the story the smells are activated through interface "scent buttons," triggering an external device (the "oPhone") to emit the respective scents.[4] This "simulation" paradoxically strengthens the feeling that digital in itself is aseptic, aiming for strategies to "digitize" information, which means making it abstract and universal, inevitably losing possible variations in reader involvement. Another work remarking upon the loss of smell in the digital reading experience is the fake conceptual website pretending to sell "Smell of Books™" spray cans with

scents like "New Book Smell" and "Classic Musty Smell" to help e-book customers feel "more comfortable with their devices."[5]

If smell's presence is easily detectable, hearing may or may not be involved in experiencing digital publications, depending on the system being used, as there are still no standard interfaces, but a plethora of different open and proprietary software systems leading to as many types of interaction with digital content. Hearing is usually involved for two different purposes: one is to better simulate the sensorial experience of print, typically using a single sound sample which is played when the user virtually turns the pages, as a "page-turning audio cue."[6] The other is to warn the user about some system-related event, using alert sounds functional to the interface. The former is a single sound sample, reiterated every time, and once the ear is trained to recognize it, it's relegated to the background, as something known and not worth anymore attention. The latter is not related to the reading practice itself, but to the software infrastructure—related to the mode of interaction, but unrelated to the content. In fact, warning sounds are generally meant to attract attention about some impending fault, their mission is paradoxically to distract from the reading by pointing to a machine-related external event.

Sight, as mentioned, is central to the reading process. One of the main characteristics of digital media is to flatten differences, abstracting information to a universal status, infinitely replicable on screen-based devices. So text always appears in a very similar way, with slightly changing attributes like brightness and contrast. E-readers at some point consolidated around "e-ink," a screen binary technology of tiny, half-white-half-black spheres, which guarantees contrast and also a uniformity of the page that is only slightly changed by variations in the natural or artificial surrounding lighting. But the market is increasingly switching from the last generation of e-readers to classic retro-illuminated (so-called backlit) screens, like tablets, smartphones, and laptops, ensuring readability in any external light condition, and usually adapting to it. In this respect, the recently introduced "night shift mode"

in smartphones shifts the "display's colours to a warmer, less blue, light so that it lowers the effect of the screen's light on a user's circadian rhythms."[7]

But as every other interface element, this is a universal behavior, shifting to the same color tone in every corner of the world at a given local time. The retro-illuminated paradigm is self-referential, taking the screen as the main source, and mostly ignoring what surrounds it, such as other forms of dim light, colors, reflections—even cutting them out with its light emissions. Sight is then captured by the light and the standard (flattened) universal modalities of display.

## PERCEPTION OF PRINTED CONTENT

In comparison, classic printed publication can claim a richer sensorial environment. For one, smell is very present, indirectly giving specific information about the book, like age, paper composition, and level of preservation. The smell of printed publications varies a lot, even within the same olfactory domain: old books, for example, smell of various degrees of dust and mold, depending on their exposure to light, the types of paper and ink, the conditions of the preserving environments, and so on. New publications, like morning newspapers or just-released books or magazines, still smell of fresh ink, but each in a different way. Readers often associate the smell of some printed publications with certain content (as with newspapers), or with some places, like particular libraries or bookstores. Technically these smells are perceptible due to several hundred so-called VOCs or volatile organic compounds, which the chemical elements in a book's paper, binding adhesives, and inks give off—in combination with the way and the place they are stored. Some scent companies have even tried to capitalize on these experiences, selling candles mimicking the smell of the *New York Times* or Byredo's "Bibliothèque," or perfumes mimicking the smell of old books, like CB's "I Hate Perfume in the Library," or freshly printed books, like "Paper Passion" produced by Gerhard Steidl and *Wallpaper Magazine*.[8] As opposed to the previously mentioned scent-manufacturers, these commercial efforts do not intend to "compensate" for

a loss, but to extract and multiply a recognizable sensorial environment, artificially recreating the experience we associate with a certain odor.

Considering scent as a medium that can "expand" print-based reading, there's a small tradition of "adding" scents to printed pages, heightening the multi-sensorial experience. This is a strategy implemented in publishing with the "scratch-and-sniff" technique, popular since the end of 1970s, especially in the educational sector. Here a small layer of a scented substance is glued onto a specific part of the page and covered by a thin protective layer, which, when scratched, releases the smell. Beyond educational possibilities, some attempts were done also in the commercial magazine field as in *Hustler*'s August 1977 centerfold, or *Vice*'s July 2011 cover.[9]

On a more conceptual level, the combination of smell and print has been occasionally used by artists. Rachel Morrison, senior library assistant at the Museum of Modern Art in New York, conducted a performance called *Smelling the Books* from 2010 to 2013, smelling and precisely catalogueing the smells of 300 out of 300,000 books in MoMA library. Her intention was to document and to foster the incredible difference in odors produced by artists' books, but also to "foster a discussion of the future of print media."[10] Another relevant work is *Aromapoetry* by Eduardo Kac, a limited-edition book with only ten copies, in a classic A4 format with twelve "poems" made up of smells, conceptually enabling the same "interpretation" mechanism of the classic poems, as both text and smell can be interpreted in a very personal way. The poems have "distinct olfactory zones on the page" and the rhythm among the different compositions provides alternating contrasting smells. The volatility of the different aromas is compensated for by the special structure of the page provided with a "nanolayer of mesoporous glass," which slows down the molecule release. The artist also provides the reader (collector) with vials and instructions to recharge every individual "poem."[11] The form of the book refers to the concept of a permanent "memory," compared to the structural volatility of smells. Scent is conceptually closer to digital than to traditional media, being ephemeral and very hard to preserve.

Hearing, on the other hand, is more accurately described as temporary than ephemeral. In traditional publishing the sense of hearing is mainly involved with the sounds generated from the physical manipulation of the publication. In books and magazines, handling the usually thicker cover produces different sounds than the flipping and bending of the internal pages. What is most important perceptually is that the sounds are always slightly different, while with a digital publication's interface, from early e-readers to recent Amazon Kindles, they are always the same.

The sight-experience of reading print is extremely varied, as pages are illuminated by exterior natural and artificial lighting conditions, combined with the varied light-reflecting or light-absorbing characteristics of paper.

## TACTILITY IN PRINT AND DIGITAL

> Unlike previous environmental changes, the electric media constitutes a total and near-instantaneous transformation of culture, values and attitudes.
> —Marshall McLuhan[12]

Beyond smell, hearing and sight, touch is the sense most directly involved in relating with the published object, proving how radical the perceptual differences between digital and print publications are.

Touch is acquired even before birth. As Frank K., Lawrence wrote in the 1960s: "Tactual sensitivity appears early in fetal life as probably the first sensory process to become functional."[13] For humans it's a primary way of understanding, especially perceiving differences. Yet in the digital realm touch is functional and mostly decontextualized. Even using mouse or trackpad "prosthetics," fingers are functionally used for clicking, swiping, or tapping in the very same way for every type of content. These are part of a growing vocabulary of abstracted gestures, codified and even patented interactions, which cannot be conceptually distinguished from the inescapable design of digital interfaces. They are "atomised, self identical, and absolute."[14] So, even though they possess the highest

concentration of touch receptors and thermoreceptors on human skin aside from the genitals, in the digital realm fingertip-experience is simply annihilated. From being extremely sensitive and "broadband" input sources for our body, they become neutral machine-oriented prosthetics. "How hard you push, whether you're sweaty, touch type or hunt-and-peck, the interface does not so much ignore as exclude these facets of touch."[15] Fingerprints become flat, relevant only as data — flattened and tattooed, they'd still work well with our digital devices, including with safety-lock features.

We deal with these abstracted gestures all the time now, after the pervasion of smartphones and tablets in our daily life and work. This was already envisioned by Jean Baudrillard when he affirmed in the 1980s that the transition from the tactile to the digital was a primary factor of the contemporary world.[16] This anaesthetization of touch to only gesture-based behaviors channels them to a purely functional role. A decade after Baudrillard, N. Katherine Hayles reflected on the implied radical changes in body awareness: "Proprioceptive coherence in interplay with electronic prostheses plays an important role in reconfiguring perceived body boundaries, especially when it gives the impression that her subjectivity is flowing into the space of the screen."[17]

In traditional publishing, tactility gives a lot of information about the medium. First, the process of paper selection is still an important part of publishers' work. Tactility gives direct information without other senses involved. For example, readers familiar with a specific book would be able to recognize it from the texture of its cover and its size, even blindfolded. In contrast, the only way to recognize an e-book is through its visual elements, such as its interface-icon, its title formatting, or its cover visuals.

Human senses are built to perceive a very large ""bandwidth" of information. The word "sense" derives from the Latin word *sensus*, meaning "faculty of feeling," that is, diversity rather than mechanical or standardized gestures and information. Tactility, as any other sense, allows perceiving differences; the more differences we are trained to perceive,

the more we learn, and the more we learn, the more we are able to perceive, in an endless circle.

McLuhan wrote that print "has acquired new interest as a tool in the training of perception."[18] There are other components in material publications that are not visible, but potentially provide rich information. Bacteria, for example, exchange information among themselves and provide information to the organisms they are hosted by. This kind of information can last for months and travel through different human bodies, often through contact with objects. So different readers may exchange information through simply passing around printed matter — or from the author to an enthusiastic fan during a signing event. Newspapers are left or passed on in commuter trains from one traveler to another; flight companies' complimentary branded magazines are touched and read in airplanes by multitudes of readers. Do these bacteria transmit information that could unconsciously effect reading?

There's no answer yet, but in a speculative sense the physical circulation of information can be considered biologically and socially, while the digital circulation of information is highly customized by the software, but conceived and constructed for quite strictly personal consumption.

The relationship between these two very different approaches seems to be appropriately defined as "the tension between virtual and visceral."[19]

THE MATERIAL SPACE OF INFORMATION

If "reading space" is considered as both the space of the content of a whole publication, as well as the perception of the available content in a given physical environment, differences between the analog and the digital are further emphasized.

Dealing with space in general is a big issue within digital publishing. In its overall "simulation" of reality, perceived digital space is constrained into a small bi-dimensional screen. It has uniquely flexible qualities, especially coupled with the speed of specific actions, as in switching content instantly, searching for specific content within thousands of texts, zooming in to appreciate details, and zooming out to get an abstract view,

just to mention a few. The potentially limitless space, as the screen can scroll and zoom infinitely and in every direction, is in fact a major perceptual limit—unlike the overview of shelves in a library, which, despite their size, can be clearly understood as defined and bordered in physical space. We're unable to visualize in a similar form all the publications that lie in a given digital storage space. We have to either search for them or scroll comprehensive lists until we found what we're looking for. The physical comprehension of depth is useless here. The size of the publication is no longer directly perceivable with sight, but has to be imagined through the number of pages displayed. This in turn removes a further perceived spatial element: knowing exactly where the reader is in reading.

Moreover, on two-dimensional screens, the page is still rendered as perfectly flat, so that it's exactly the same on any device, universally standardized in a perfectly rendered simulation. French researcher Émeline Brulé defines the digital simulation of print as "mimetism." In digital territory, the human sensory system is prone to a functionalist approach, rather than being able to refine its perceptions. We have thus adapted a new flattened vision to digital publishing, and we'll continue to adapt, but what we could progressively miss is the ability to perceive nuances of flexible and variable conditions.

Print has become a rare exception: it is the only remaining medium in use, besides perhaps vinyl records, whose content can be "mechanically" accessed and enjoyed. It belongs to the visible material space of information that can be touched and read directly at the same time. Considering, for example, the rising IoT (Internet of Things) as a global infrastructure, one of its perceptual values is the ability to feel the presence of—to "touch"—the interconnected objects, giving shape and location to them as networked agents, contrary to abstract blinking routers and mostly invisible servers. This represents an urge to engage with objects as special and singular entities. Dealing with an object singularly identifiable in space often entails making an emotional investment in it, and identifying or retrieving it makes it a protected investment. Because of

its enormous size, digital space makes it harder to appreciate the singularity of an entity of information.

With the late-seventies desktop metaphor mostly unchanged today, even in its mobile adaptations, the interface fails to cope with the amount of content we currently deal—and could deal—with. We are confronted with an "infinitely deep" desktop with the few reference points that can fit on a small screen, and automatic but not yet truly intelligent search capabilities. Digital publications inevitably have to cope with these limitations, but, in turn, they can also take the opportunity to exploit their unique ability of hosting infinitely reprogrammable and infinitely transmittable content. But simply trying to successfully simulate the (unsurpassed) print "interface" is a futile task, as Umberto Eco noted: "The book is like the spoon, scissors, the hammer, the wheel. Once invented, it cannot be improved."[20]

Digital content could build on the ability to instantly create, combine, and especially calculate content and relationships among content. This could create a different, original relationship with the reader, accomplishing a level of intimacy in the reading experience close to the one that McLuhan attributed to printed materials.

In this kind of intimacy, tactility could play a fundamental role, even if there is no simple equation to fill the gap between the machine and our fingertips' biological qualities. While Apple filed a patent in 2007 for a "tactile touchscreen," in robotics the still-primitive tactile sensors, while modelled after the biological sense of cutaneous touch, heavily simplify it, and they are definitely uncertain, for example, when it comes to sensing pain.[21] How would a reader "feel" the cover of the artist's book *Mémoirs*, by artist Asger Jorn and theorist Guy Debord, which is made of heavy sandpaper and so affecting every material comes into contact with, from hands to shelves?[22] Would an algorithm be ever educated enough to interpret it? This is of course an extreme example (a machine interpretation of conceptual design), but in any case tactility should be enhanced in digital publications in a perceptual way, going beyond the industrial functional standards. It could appeal, instead, directly to our nerve endings, stimulating their very

high perceptive qualities, perhaps with the use of new artificial materials, able to assume a number of different states. The consequent tactile (and other sensory) experiences would challenge the sensory system to recognize and learn something completely new.

Beyond the information identifiable with the fundamental senses, there's still a lot more information received and transmitted through the body and brain, but it is either immaterial (light, waves, heat) or encoded, as everything electronic and digital is. So if traditional publishing objects are a well-orchestrated epicenter of information, aiming to guarantee a satisfying reading experience, digital publishing in its current standards and embodiments represents instead a deprived one. The functional ideology behind it still blocks the vast potential of software to transform and interconnect the content with external human and virtual sources. Refocusing the current behavioral approach to an extended perceptive one, and aiming to enable social and cultural interconnections instead of automatically produced, customizable industrial products, would potentially lead to completely new types of published objects.

HYBRID PUBLICATIONS AS
PROCESSUAL PRINT

This type of evolution of digital publications would not only deal with senses in a desirable way, supporting our biological need to appreciate and learn new perceptual differences, but would also unleash the huge potential of software and networks that are now relegated to a few "service" features. This process would eventually involve traditional publishing, creating perhaps a single entity that could be called a "hybrid," a recognizable publication that would deeply "perform the networks."[23] This notion of performing networks is already being considered in the contemporary artists' publishing scene, through combining web content and processes with traditional publishing.

One example is *American Psycho* by Mimi Cabell and Jason Huff.[24] It was created by sending the entirety of Bret Easton

Ellis's novel *American Psycho* through Gmail, one page at a time. They then collected the ads that appeared next to each email and used them to annotate the original text, page by page. In printing it as a perfect bound book, they erased the body of Ellis's text and left only chapter titles and constellations of their added footnotes. What remains is *American Psycho*, told through its chapter titles and annotated with relational Google ads only, as it might have been read by a Google software robot eye. The active and tangible machine presence inside the printed page is described from a dystopian angle by the publisher, Luc Gross: "Until now, books were the last advertisement-free refuge."[25] He asserts that "inline ads" will become what the product placements are now in movies, for example, and that those mechanisms could change literary content itself and not only its containers.

Another hybrid work is Stéphanie Vilayphiou's net-art piece *La Carte ou le Territoire* (The Map or the Territory) in which she selected a controversial book of the same name by Michel Houellebecq, which was renowned and discussed in France for its borrowing of evident quotes from Wikipedia, never acknowledged by the author nor by the publisher.[26] Vilayphiou retrieved the book's digitized text and wrote a software filter which parses it in sentences (or part of it), looking for the same phrases in the millions of digitized texts contained in Google Books. The result is the same book transformed into a unique sequential digital collage of quotations from other books, definitively losing even the last bit of originality. Visually, the found sentences are highlighted in yellow, but are rendered in their original typefaces, the original authoritative printed context still maintained in the background. Vilayphiou ultimately questions originality and authorship through software automation. These are two early examples of hybrids as the processes they initiate end with the respective books, even if they would be impossible to realize without software and networks.

What I've tried to define as "post-digital print" is a publishing practice that literally absorbs digital technologies. Proper future hybrids would reflect the dynamic and rich nature of publishing with embedded computational characteristics. These computational elements should process information

and include the results in classic publications, producing new publication typologies, and, in turn, new attitudes and publishing structures. This type of publication would be able to mix running code and unchangeable content, integrating processes and stability in the same place. Eventually they would be able to react to possible feedback from the processes they triggered, and reflect this feedback in their own structures. These strategies would evolve what I've termed "processual" publishing. Technical processes would potentially enable social and perceptual processes in a horizontal collaborative scenario where the printed and digital media would intertwine, with paper, software, and networks working as a whole, forming new sensorial combinations. This would occur in direct relationship with our senses, but simultaneously reflect the unchangeability of the printed page and the perennial dance of information in the digital world.

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The storm propels the Angel backwards

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Elegy for the Collapse of PAL (2010–2012)
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PAL slowly vanishes in these eerie ruins

On November 1, 2009, Denmark switched its television broadcast technologiesfrom Phase Alternate Line (PAL) signal, to its successor, Digital Video Broadcasting (DVB). With this switch, PAL became obsolete. Its transmission was suspended and its technologies were no longer supported; PAL became part of the "zombie media."[1]

Early in 2010, tv-tv, a non-commercial, artist-run television station broadcasting from Copenhagen, chose this "golden spike"—the switch from PAL to DVB—as a motive for commissioning SOUND & TELEVISION, a "transmission art project exploring the performativity of television in light of the challenges brought about by a converging mediascape." The project consisted of seven live television performances.[2] One of those, titled *The Collapse of PAL*, honed in on the switch from PAL to DVB, narrated from the perspective of the ''Angel of History'':

The muting of PAL was a brutal, but silent execution. I wanted to stay and reinstate the dead connection, make whole what had been broken … But the storm called Progress caught my wings and propelled me backwards, into a future of digital broadcast technologies. In front of me, I could see a pile of debris growing ever skyward; old connections that were just not good enough, declared obsolete and left behind, to lose their significance. PAL disappeared within these eerie ruins, running through them as a lost history of transmission.[3]

Since the switch to DVB, the Angel of History has not been able to transmit to PAL. Recently, however, a technology named Syphon made it possible to broadcast and connect different formats and signals—old, new, and even obsolete—via local servers. For the first time in years, PAL and the Angel of History can now reconnect.[4] What follows is a transcript of their first Syphoned connection.

# Rosa Menkman
# Elegy for the Collapse of PAL (2010–2012)

**Rosa Menkman** is a Dutch artist and researcher who focuses on visual noise artifacts resulting from accidents in both analog and digital media. She believes that these artifacts can facilitate an important insight into the otherwise obscure alchemy of standardization via resolutions, which entails not just the creation of solutions, but also black-boxed, unseen, forgotten, or obfuscated compromises and alternative possibilities.

**transmediale 2014 afterglow** Art Hack Day Berlin **transmediale 2k+12 in/compatible** ideomotoric chatroom + The Glitch Moment(um), Performance, 02.02.2012 / Uncorporated Subversion: Tactics, Glitches, Archeologies, Conference, 03.02.2012 / Knotty Problems in the Fables of Computing, Keynote by Matthew Fuller, 04.02.2012 **transmediale.11 RESPONSE:ABILITY** The Collapse of PAL, Performance, 03.02.2011

a lost signal

Angel of History...SyphonServerAnnounceNotification / ping /
PAL............SyphonServerUpdateNotification / ping /
Angel! Only a Möbius strip could describe the frequency of my phase … to connect to you, since my suspended services in 2009 … how to transmit this? Is this what they mean by "a new Line"?
Angel of History...It's un—syncable! While I am still progressing backwards into a future, constantly upgrading to more complex levels of encryption, I can Syphon you! I do understand what you mean with "a new Line." But our connection no longer involves just the transmission of 625 Lines over the air or through a wire. In order to connect, your signal is now transmitted to a local Syphon server, from where it is broadcast as a multiverse of lines, kludged in and pushed through the channels of newer technologies, the upgrades.
PAL............That sounds complex. For some years you still reached out to me, in a broadcast that I could not receive, titled The Collapse of PAL. Would you transmit it to me now?
Angel of History...The Collapse of PAL broadcast consists of a triptych of obsequies. The first part, Obituary, positions you in what historians call Media Archeology. It reads: "PAL. Offspring of Walter Bruch—Survived by DVB (MPEG2)," however, the signal is obfuscated through chromatic aberrations, as a result of channels that got misaligned due to our growing anachronisms.
In the second part, Eulogy, I describe my experience of your suspension, while the Horsemen of Progress are pulling me into the realm of DVB.
In the third chapter, Requiem for the Planes of Phosphor, I write that you still exist as a trace left upon newer, "better" digital technologies. Even though your technologies are obsolete, I can still render you as a historical form, from which newer technologies are built, inherited, and appropriated.
PAL............So did you still use Lines for every iteration of The Collapse of PAL?
Angel of History...No. The Obituary and Eulogy used the signal PAL, but the third part, Requiem for the Planes of Phosphor, involved an array of digital compression technologies, some of which don't use any kind of line—based encoding system. Besides that, after its inauguration on tv—tv, The Collapse of PAL was broadcast a few dozen times within different frameworks, formats, and nations; most of these shows took place in PAL but sometimes they used NTSC.[5] Moreover, The Collapse ran as a recording and as live performance, solo or in collaboration. One of my favorite Collapses happened at the Cinemateca Brasileira, Sao Paulo, in 2011. This Brazilian fork of the Collapse was a collaboration between Rosa Menkman, Bernhard Fleischmann, the Optical Machines (a Dutch group that performs MIDI—synced shadow—play), and Defi, a graffiti artist from Argentina, and it involved, among an array of analog synthesizers and computers, unprocessed light and paint. I believe these different iterations, the last of which took place in 2012, illustrate that your lines can now exist on a multiverse of vectors.
PAL............Vectors? Do you broadcast vectors? How do I process that?
Angel of History...Think about vectors as objects _ in this case visual objects _ with a value, a magnitude, and direction. You see, I run signals from a future. other technologies that introduce new logical systems, frameworks, bandwidths, and formats. I encode and decode these vectors, which evolve over time and are written within a media ecology.
PAL............Ah, I render that!
Angel of History...I am a slave to all of these vectors and I can only re—image these lines, while being dragged along them. It's the Four White Horsemen who move this carriage.
But let's be clear: since your suspension, none of these "better" lines _ or new broadcast technologies _ have been flawless, the DVB signal that replaced you is different, but also inherently flawed. Even the newest and most advanced broadcast technologies possess their inherent flaws.
But I also I decode that these imperfections obtain values within themselves; they grow hyperstacks of expressions, falling in and out of semantics, as a lexicon of un—phased encodings. Burst! Since we can again broadcast and connect, we can actually create an image together. We can rewrite, fork … we can create a daemon!
PAL............We may re—render The Collapse of PAL a love letter!
Angel of History...</br>, you're clipping! _ ///
SyphonServerRetireNotification

1 Jussi Parikka, "Media Archaeology of Signals (transmediale 2011)," Cartographies of Media Archaeology, February 7, 2011, http://mediacartographies.blogspot.de/2011/02/media-archae-ology-of-signals.html (accessed September 22, 2016).
2 The curators of SOUND & TELEVISION were Kristoffer Gansing and Linda Hilfling. An archived version of the project website, including descriptions, can be found at:https://web.archive.org/web/20160331131714/http://tv-tv.dk/soundandtelevision/#.
3 During a performance, the reflections of the Angel of History would appear as live transcription, projected on top of the video stream, following the style of Teletext. The narrative would differ slightly per iteration as it was typed live. A render of The Collapse of PAL can be found on Vimeo: https://vimeo.com/12199201.
4 Syphon is an open-source Mac OSX technology that allows applications to share frames—full-frame rate video or stills—with one another in real time. Syphon. framework, the test suite, and the initial implementations were written by Tom Butterworth and Anton Marini.
5 The Collapse of PAL was performed a handful of times in the US, where analog video is projected via the alternative NTSC [National Television System Committee] standard. Most countries using the NTSC standard have, just like PAL, switched to, or are in process of switching to, newer digital television standards. This is why every broadcast of The Collapse of PAL ended with a shout-out to NTSC.
6 In 2012 The Collapse of PAL briefly came out of retirement during "The Last Event" at the Netherlands Media Art Institute.

# Florian Cramer
# When Claire Bishop Woke Up in the Drone Wars: Art and Technology, the nth Time

Post-internet, circulationism, big data, memes, drone wars, signature attacks, Dark Geography—terms that a few years ago would only have been used in media studies and new media art festivals have now become a mainstream language for contemporary art. The origins of these terms lie in technology. One is tempted to conclude that 1990s media theory, summed up in Friedrich Kittler's dictum that (technological) media determine our situation, has been proven right, only that it took contemporary art twenty years to catch up. Yet such a narrative would put technology and the arts into a reductive sender-and-receiver hierarchy where technology informs the arts, and the arts merely depict or reflect upon technology. More importantly, this narrative would gloss over the fact that today's technology development crucially involves symbolic forms more commonly associated with the arts: storytelling, poetics, rhetoric, visual culture. As technology is never pure research or pure formula, but a hybrid of research and its practical application, it also includes the metaphors, buzzwords, and hypes used in its development and deployment.

Technology has become (and is widely referred to as) part of the "creative industry," ever since the technology companies with the highest market value—Google, Apple, Microsoft, Amazon, and Facebook—started producing products and services that blend engineering, design, and marketing. A striking example of buzzword and meme coinage as part of technology development is Instagram, which, as a start-up, had only a few dozen staffers, no technological inventions, and hence no filed patents, yet was bought up by Facebook in 2012 for one billion dollars. The same is true of any other technology company on the stock market, because value is not determined by present performance, but future potential—the science fiction of products and services. One might therefore regard the current state of technology as conceptual art rather than looking at contemporary art as having to catch up with the state of technology.

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## ARS AND TECHNE

When revisiting debates on art and technology from recent decades, there is a recurring philological argument: namely, that *ars* and *techne* are one and the same word, only the former is Latin and the latter is Greek. Up until the Renaissance, what is now differentiated into "art," "craft," "technology," and "science" was in the same category. Painting, agriculture, and mathematics, for example, would have all been called *artes* up until the late seventeenth century. The nominal split between art and technology only occurred when the sciences became empirical and the arts speculative.

If one wanted to amend this split and alienation, the question would be: on whose terms? If one takes, for example, the paradigm shift from "arts" toward "creative industry" in much of Europe, then the answer is clearly: on the technology industry's terms. Governmental creative industry programs are, contrary to what many believe, not aimed toward redefining the arts, but about creating new Apples and Googles.

The historical split between art and technology was first debated in media theory. Marshall McLuhan's 1960s definition of the medium as the message tactically conflated the notions of the artistic medium (such as abstract painting, where the medium of painting becomes its own message) and of the mass communication medium (such as television, where watching the Apollo moon landing is not actually about the moon landing, but about watching television, and about the "global village" of people watching).[1] Later, in the 1980s and 1990s, institutions like the Austrian Ars Electronica festival (which uses the term ars for a good reason) and the Massachusetts Institute for Technology (whose media arts journal is called *Leonardo* for a good reason) made the reunion of art and technology an explicit agenda. Yet their discourse and apparatus has been clearly biased toward technology research and development as the model for art.[2] This is most obvious in the paradigm of the "lab" for art production, from media labs to fab labs and bio-art labs. Since the 1960s, contemporary art has sought just the opposite, by breaking out of studio spaces to create artist-run spaces and public space interventions that very often were the art itself.[3]

Contemporary phenomena such as post-internet art grew straight out of the contemporary art system, not out of media labs, which was likely the reason for their success. But for the sake of historical justice, it must not be forgotten that net.art in the 1990s did not come out of media labs either, but from non-institutional contemporary art practices. It was too far ahead of its time. The internet simply wasn't yet part of a wide cultural vocabulary, and the idea of a critical aesthetics of technology was still too esoteric to allow contemporary audiences to appreciate net.art.

"Circulationism," coined in 2013 by Hito Steyerl, is a catchy and useful contemporary art term that describes a paradigm shift from the making of high-end products (which contemporary art fairs, biennials, and the gallery and museum system are essentially focused on) to the perpetual posting, reposting, plagiarizing, and modifying of low-end visuals in social networks.[4] It suggests that the value of art lies in its proliferation and mutation rather than in its control by the maker and its collectibility as an autograph. Yet circulationism is not new from a historical perspective. It began with Renaissance emblems and pamphlets (whose production and reproduction was not yet regulated by copyright and included countless instances of plagiarism and reworking), continued with Dadaist collage, Mail Art, and punk zines, and became digital with net art, websites like UbuWeb, and imageboards.[5]

FLIPPING THE TECHNO-DETERMINIST PERSPECTIVE

For several decades, science and technology have been used as a tactical assault weapon against the romanticist legacies of the arts and humanities, most prominently in media philosophy and digital humanities. Throughout his career, Kittler used, with Nietzschean furor, technology as a club for beating the shit out of the traditional humanities.[6] If one applied his discourse analysis of technology to post-internet and circulationist art, then it could no longer be described as contemporary artists' positions on internet-age culture. Instead, it would be described in the opposite way: post-internet as the cultural product of image compression algorithms and circulationism

as a product of packet switching in network protocols. This would be a techno-determinist view on culture. According to this view, technology is no longer a product of culture, but culture is a product of technology.[7]

This could be dismissed as a small part of some academic debate and hairsplitting over concepts. Yet the idea also has power in practice. The so-called new economy is based on the same techno-determinist model. Start-ups are typically based on the idea that a particular piece of technology will disrupt and reinvent some part of culture (or even nature). For example: Amazon and eBay reinvent retail, Instagram reinvents photography, YouTube and Netflix reinvent moving images, Facebook reinvents friendship, Airbnb reinvents hospitality, Bitcoin reinvents finance, and Google's artificial intelligence projects reinvent intelligence.

In this scenario, art is doomed to lose. It will be caught in a perpetual catch-up game, always behind the latest techno-cultural developments. This is the techno-determinist line of thought, which the 2001 edition of Ars Electronica referred to with the motto "Takeover," meaning that the technology sector had taken over the function of the cultural cutting edge from the arts. It partly accompanied and partly anticipated neoliberal creative-industry politics (like in the Netherlands, where the government scrapped all humanities research funding in favor of technology-centric creative industry applied research in 2011). "Takeover" relegates art to either becoming part of research labs or being dumbed down to merely depicting the techno-cultural present, instead of speculating and engaging with it.

In this hegemonic game, technology has the argument of efficacy on its side. Not only is technology made of things that get things done, but on top of that, things that seem to be founded on objective science. In positivistic technology discourses, and for philosophers like Francis Fukuyama, "post-human" therefore is not at all a feminist, ecologist, or critical ontological concept. It is not at all one that relativizes humanism by putting humans into a larger ecology of beings and objects, now known in contemporary art and humanities from Speculative Realism, object-oriented ontology, and dis-

cussions of the anthropocene. Instead, in those contexts post-human means artificial intelligence robotics, bio-engineering, and the belief that most or all cultural and interpretative processes can be replaced with algorithms.

This remains science fiction today. Its feasibility is disputed by many scholars, including Noam Chomsky, who insists that intelligence can only be algorithmically modeled when there is a comprehensive scientific theory for it, which thus far does not exist.[8] This science fiction is only believed because too few know how computer technology works, what it can do, and what its structural limitations are. In his 1946 book *The Failure of Technology*, German conservative thinker Friedrich Georg Jünger wrote that "the belief that technical organization can create something beyond its technical objectives needs reexamination. We must discover the role which illusion plays in this context. Today, faith in the magic power of technical organization is more widely held than ever, and there is no lack of eulogists who extol it as a cure-all."[9]

Jünger's book is surprisingly contemporary in its criticism. Back in its time, it provided the foundation for Heidegger's existential philosophy of technology as second nature. Jünger's insistence on "illusion" as an intrinsic property of technology runs contrary to the common assumption that science and technology are not metaphorical. Yet the opposite is often true, which perhaps becomes most obvious when technology enters traditional realms of humanities. Examples include:

— "Machine-based learning" and "deep learning": these technologies are based on a metaphorical use of "learning" for recursive statistical data analysis that no educational theorist would accept as "learning."

— The "neural networks" used for "deep learning" are themselves a weak metaphor, since science does not have a complete model of how the brain and its neurons work, and since the model used for computing is greatly simplified.

— "Machine interpretation" of text and images is limited to syntactical analysis, with the underlying assumption that sta-

tistical-mathematical analysis will amount to semantic interpretation if it is complex enough. No literature or philosophy department would ever accept this as "interpretation."

— "Data mining" means primitive statistics are run on data sets for which, in the end, human interpretation is necessary to filter out useful correlations from garbage conclusions. (Such as: people eating ice cream in forests create a higher risk of forest fires, while, in reality, hot weather both causes people to eat more ice cream and increases the likelihood of forest fires.)

— There is no conclusive scientific observation of intelligence on whose basis artificial intelligence could be modeled. The fact that artificial intelligence research tries to find a theory for intelligence as a whole, through computer modeling, contradicts the empirical paradigm of modern science. Instead of deriving a concept from experiment and observation, artificial intelligence works with a predefined result that it tries to retroactively prove. In other words, artificial intelligence research coined its outcome as science fiction and now tries to prove the truth of this fiction.

When employing the above technologies, arts, design, and humanities most often end up creating some form of computer-aided statistical analysis and visualization. Among others, the work of Trevor Paglen shows how this can be done in engaging ways, but otherwise, there is an enormous discrepancy between the promises made by the language ("learning," "neuronal networks," and so on) and the banality of the results. Banality is, as Hannah Arendt insists, not harmless. A contemporary example of this are the "signature attacks" by the US government and its allies, in which people (in the Middle East and Afghanistan) are killed by drones on the basis of statistical computer analysis of their movement patterns and automated probability estimations that the subjects are, because of their movement patterns, "terrorists." There is hardly any public outrage or political debate about this. It is not even an issue in the election programs of left-wing political candidates in

the US like Bernie Sanders, most likely because quasi-religious belief and magical trust in these pompously named technologies prevails — because too many people think that, for example, neural networks aren't just the same kind of metaphor as "artificial stomach" for a garbage can.

While this concerns the dystopian side of technology, it applies just as much to techno-utopian visions of transforming culture and society through machines. To this, Jünger objects that "those who place their hopes in the machine — and hope implies an anticipation of the future [...] ought to be aware that the hopes themselves must be of a technical kind, for one cannot expect from the machine something which lies outside its potentialities."[10]

Jonas Lund is a post-internet generation artist who plays with these hopes and beliefs. In his work, he pretends to data-mine and computationally analyze successful formulas for contemporary art and derive technical instructions for contemporary art-making.[11] The artist concedes that his computational analysis (based on Markov chain algorithms, the historical forerunners of neural networks) boils down to smoke and mirrors, an "illusion," to use Jünger's term, that is both produced and rationalized by computation. Lund's smoke and mirrors, however, are not structurally different from those of technology start-ups, including websites like ArtFacts.net and ArtRank.com, which use non-disclosed algorithms to globally rank contemporary artists. Belief in the objectivity of computation is what sells these products and services, never mind the popular motto in the design and internet industry to "fake it till you make it."[12]

## WORDS THAT CONSTRUCT THEIR OWN REALITY

The illustration at the beginning of this essay shows the "structural differential," an invention and construction drawing by early-twentieth-century Polish-American speculative thinker Alfred Korzybski, in a version annotated by Tim O'Reilly, founder and owner of O'Reilly Media, arguably the most influential Silicon Valley technology publishing house and conference organizer. O'Reilly played a central role in popularizing the terms "open source" in 1998 and "Web 2.0" in 2004. Korzybski

referred to language as a "map" and the world as "territory," insisting that the "map is not the territory" — that most problems in the world result from a reductive representation in words wherein words become their own reality.[13] For critic Evgeny Morozov, O'Reilly is Korzybski's sorcerer's apprentice, playing the very game that Korzybski criticizes, namely, the creation of reality through coinage of neologisms.[14] "Web 2.0" is a technically meaningless term, since there has never been a version 2.0 release of the World Wide Web's software architecture and protocols.[15] Instead, "Web 2.0" was simply a marketing term, coined to revive people's interest in the Web shortly after the stock market crash of the "new economy" in the early 2000s.

Because of their dependence on investors, pitches, and growth scenarios, many if not most technology companies run on fictions. They produce investor stories not only to sell product development, but also in order to preemptively influence the whole market.[16] Narratives, memes, and rebranding are common industry devices for this purpose. Prominent examples, aside from "Web 2.0," include the rebranding of "computer program" as "app," "statistical computing" as "data mining," and "network servers" as "the cloud." The same game has been played in modern and contemporary art, for example, in the rebranding of abstract painting as "Minimal Art" in the 1960s, as "Neo-Geo" in the 1980s, and as "Zombie Formalism" more recently, or processual community art as "relational aesthetics" in the 1990s. This amounts to the same business model used in financial markets and real estate business. The function of these fictions is to lure in capital as speculative investment, with the influx of capital based on a good investor story. The art market has worked according to the same principle since at least 1945. Its more extreme speculative form of "flipping," fast acquisition, and resale of artworks is a recent phenomenon that perfectly corresponds to high-frequency trading in the financial system. (Jonas Lund addressed and played with it in his work *Flip City*, a series of paintings that sample and remix "zombie formalist" paintings and contain GPS tracking devices locating their current whereabouts.[17])

The convergence of art, technology, marketing, and finance through storytelling — both in the art market and in the tech-

nology industry—might be simply called postmodern, and could be described with Jean Baudrillard's notions of simulation and simulacra.[18] But these fictions and simulations do not simply amount to hyperreality; they create hard facts, as they did in the financial markets before and after 2008. They involve real flows of capital, real jobs, real estate, and investor money (which may be diverted into other, safer funds to cover the startup founders if their enterprise falters, or maybe kickstart funding for eventually selling the company to a larger corporation, which in venture capitalist jargon falls under "exit strategy"). The economical, political, and social repercussions of these speculations are the same that befell the Lehman Brothers and Goldman Sachs in 2008.

The point here is not an ethical or political critique from an arts perspective, since art markets and media industries work according to the same principles, and may even be seen as historical forerunners of the contemporary tech economy. Yet the fictioneering inherent in contemporary technology disproves the common assumption of contemporary art having to catch up with technology. In the early 1970s, art critic Lucy Lippard published *Six Years: Dematerialization of the Art Object from 1966 to 1972*, arguably still *the* book on the emergence of Conceptual art.[19] The "dematerialization" and uncoupling of artwork and material realization she described seems, in retrospect, to be a forerunner of the uncoupling of the US dollar and other Western currencies from the gold standard in 1971. In 1970, art critic Jack Burnham curated what is widely regarded the first major show of American Conceptual art, which took place in the Jewish Museum of New York. Its title was "Software," based on the same idea of dematerialization central to Lippard's book: software as immaterial versus hardware as material work.[20] This exhibition took place five years before the founding of Microsoft, the first company to sell software as a consumer product.

In the 1980s, "appropriation art" emerged, not only as mainstream art in the West, but also as underground art in Eastern Europe (from, among others, NSK in Slovenia) and in the subcultural "Festivals of Plagiarism" that took place in the UK and elsewhere.[21] These art currents, and the discourse they

produced, fully anticipated what became popular culture ten years later on the internet: mp3 and video file sharing, Napster, The Pirate Bay, open-source software, 4chan, image memes, and the Anonymous movement. While "circulationism" is a much clearer word than "appropriation art" or "plagiarism" for these poetics and aesthetics, it is nevertheless problematic to frame the term as contemporary art's reaction to recent technological developments.

## A HARD AWAKENING IN THE DRONE WARS

The larger picture of the relationship between art and technology is not a simple sender-to-receiver or cause-and-effect model. Neither are technological developments the cause and art its effect, nor vice versa. Instead, the two consist in a discursive field with mutual feedback. Being under lighter norms of technical efficacy while having developed more complex storytelling, art typically has the edge over startup science fiction when it comes to speculation and even foresight, no matter whether in the "dematerialization" of early 1970s Conceptual art or in the 1950s–'70s science fiction of Philip K. Dick.

In 2012, art critic Claire Bishop wrote in a widely discussed *Artforum* article "The Digital Divide": "Whatever happened to digital art? […] Wasn't there [in the late 1990s] a pervasive sense that visual art was going to get digital, too, harnessing the new technologies that were just beginning to transform our lives? But somehow the venture never really gained traction."[22] Four years later, these sentences sound as if they were written in a different century, but they represented the mainstream of contemporary art criticism and curatorship in that time. Bishop and her colleagues have literally woken up during the drone wars and the Snowden leaks, as if a time machine had propelled everyone into a dystopian future, a future that turned out to be the present.

This realization became more commonplace with Accelerationist theory and its coinage of "post-contemporary" art for the 2016 Berlin Biennial. In a conversation with Suhail Malik for the exhibition website, Accelerationist theorist Armen Avanessian argued that "we are not just living in a new time or

accelerated time, but time itself—the direction of time—has changed. We no longer have a linear time, in the sense of the past being followed by the present and then the future. It's rather the other way around: the future happens before the present, time arrives from the future."[23] This rhetoric is willfully oblivious to history. It pretends that contemporariness does not include speculative time constructs—as if the same claims hadn't been made in early modernism, from Italian and Russian Futurism to Walter Benjamin's observation that World War I soldiers returned "not richer, but poorer in communicable experience," because "strategic experience has been contravened by positional warfare; economic experience, by the inflation; physical experience, by hunger; moral experience, by the ruling powers."[24]

It thus looks as if the contemporary art world is swinging, in a shock reaction to its own ignorance of the cultural impact of new technology, from one extreme to the other, from naïve humanism to naïve post-humanism, to a rehash of 1990s cyberculture, a discourse whose speculative imagination was far ahead of—and rather uninformed about—the realities of technology and therefore ended up naïvely buying into high-tech hypes like "cyberspace" and "virtual reality." It is not surprising that the senior figures of Accelerationism are, like Nick Land, 1990s speculative cyberculture theorists. To return to the example of drone wars: any reading of them as a rupture in time would be oblivious to the fact that their cultural imaginary has been under construction for decades, by science-fiction novelists and filmmakers, by drone music composers and drone cinema makers.[25]

Contemporary art conservatives like Bishop and "post-contemporary" advocates like Avanessian and Malik end up being each other's dialectical mirrors and mutually reinforcing opposites. Both reject technology as a contemporary issue, and hence any technically informed, structural, critical engagement with its codes and configurations.[26] Furthermore, Accelerationism and neo-cyberculture gloss over the critical revision of "new media" for which "post-internet" first stood. In 2010, artist and critic Gene McHugh wrote on his blog *Post Internet*, which ultimately gave post-internet art its name, that

"any hope for the Internet to make things easier, *to reduce the anxiety of my existence, was simply over*—it failed—and it was just another thing to deal with. […] It became the place where business was conducted, and bills were paid. It became the place where people tracked you down."[27]

Although McLuhan and Kittler's techno-determinist theories now sound like distant voices from the past, they were useful in their own time as intellectual provocations against idealist and humanist positions in the arts and humanities, romanticist baggage, which was still around because it had been left unattended. Now, where art and technology industries mimic each other's devices, it is time to move beyond the tired and simplistic humanist-versus-post-humanist dichotomy. Post-internet began as one of the tendencies that promised exactly that, before it became reduced to a style and a retro-'90s art-and-theory spectacle. Technologically literate artists, theorists, and activists have known, from their first-hand experiences, that technology involves human agency (including politics) and post-human agency, control and loss of control at the same time. From Dadaist chance painting in the 1920s to the Gutai group's performance art in the 1950s and Afrofuturist science fiction today, the arts have created the most complex imagination of these issues—which are now issues of society at large. If mainstream contemporary art, in its current future shock, remains oblivious to this past, it will again miss the present.

1    Marshall McLuhan, *Understanding Media: The Extensions of Man* (New York: McGraw Hill, 1964).

2    The North American history of art in science labs is reconstructed in Lutz Dammbeck's documentary film *Das Netz* (Leipzig: b.film Verleih, 2003).

3    Historically, lab art has its roots in electronic music rather than visual art. In its beginnings, electronic music had to be produced in lab environments due to technological constraints. Good examples are the Natlab studio run by Philips in Eindhoven, Netherlands, where composer Dick Raaijmakers was employed, and Ars Electronica, which historically grew out of the annual Bruckner festival in Linz.

4    Hito Steyerl, "Too Much World: Is the Internet Dead?" *e-flux* journal no. 49 (2013), http://www.e-flux.com/journal/too-much-world-is-the-internet-dead/.

5    Even in cultural activism and theory, circulationism has been discussed, under different monikers, for more than a decade. Examples include the open source, peer-to-peer, and hacker cultures whose implications for the arts were discussed in the late 1990s at the *Wizards of OS* conference series in Berlin, in Pirate Parties, and the commons movement, and more recently in Kenneth Goldsmith's poetics of "uncreativity." See *FLOSS+Art*, eds. Aymeric Mansoux and Marloes de Valk (Poitiers, France: OpenMute, 2008); Kenneth Goldsmith, *Uncreative Writing: Managing Language in the Digital Age* (New York: Columbia University Press, 2011).

6    Kittler announced his program of "exorcising the human from the humanities" before he became a media theorist, in Kittler, *Austreibung des Geistes aus den Geisteswissenschaften: Programme des Poststrukturalismus* (Paderborn: Schöningh, 1980).

7    Kittler, a professor of aesthetics and cultural studies, ultimately wanted to establish a counter-model to Marxist cultural studies. See Kittler, *Eine Kulturgeschichte der Kulturwissenschaft* (Munich: Fink, Wilhelm, 2001). For a critique of this book, see Friedrich Vollhardt, "Kittlers Leere," *Merkur* 55, no. 8 (2001): 711–16.

8    Noam Chomsky, "Lecture on Artificial Intelligence," lecture at *Navigating a Multispecies World: A Graduate Conference on the Species Turn* (Cambridge, MA: Harvard University, 2013), https://www.youtube.com/watch?v=TAP0xk-c4mk.

9    Friedrich Georg Jünger, *The Failure of Technology: Perfection without Purpose* (Washington, DC: Henry Regnery Company, 1949).

10   Ibid.

11   Annet Dekker, "The Absurdity of Art Speak, Art Worlds, and What We Can Learn from Big Data," *Furtherfield*, July 18, 2016, http://www.furtherfield.org/features/absurdity-art-speak-art-worlds-and-what-we-can-learn-big-data (accessed September 19, 2016); Mallika Rao, "Controversial New Project Uses Algorithm to Predict Art," *Huffington Post*, July 18, 2016, http://www.huffingtonpost.com/entry/jonas-lund-art-algorithm_n_4214211 (accessed September 19, 2016).

12   Graphic designer and researcher Silvio Lorusso investigated this particular motto in a video documentary on two Silicon Valley startup entrepreneurs. Lorusso, "Fake It Till You Make It," 2016, http://silviolorusso.com/work/fake-it-till-you-make-it/.

13   Alfred Korzybski, *Science and Sanity: An Introduction to Non-Aristotelian Systems and General Semantics*, 3rd ed. (Lakeville, CT: The International Non-Aristotelian Library Publishing Company, 1948).

14   "Tim O'Reilly is, perhaps, the most high-profile follower of Korzybski's theories today. […] O'Reilly openly acknowledges his debt to Korzybski, listing Science and Sanity among his favorite books and even showing visualizations of the structural differential in his presentations. It would be a mistake to think that O'Reilly's linguistic interventions—from "open source" to "Web 2.0"—are random or spontaneous. There is a philosophy to them: a philosophy of knowledge and language inspired by Korzybski. However, O'Reilly deploys Korzybski in much the same way that the advertising industry deploys the latest findings in neuroscience: the goal is not to increase awareness, but to manipulate." Morozov, "The Meme Hustler," *The Baffler,* no. 22, March 2013.

15   "Web 2.0" neither refers to the Web's http standard, nor to its HTML document format. The http protocol of the World Wide Web was at version 1.1 until 2015 and HTML at version 2.0 only in the pre-"Web 2.0" period of 1995–1997.

16   For example, the announcement of a "revolutionary digital camera with game-changing technology" could not only lure in investor capital, but also decrease the stock market value of existing camera manufacturers.

17   Jonas Lund, "Flip City," 2016, http://flip-city.net.

18   Jean Baudrillard, *Simulacra and Simulation* (Ann Arbor: University of Michigan Press, 1995).

19   Lucy R. Lippard, *Six Years: The Dematerialization of the Art Object from 1966 to 1972* (London: Studio Vista, 1973).

20   Jack Burnham, *Software: Information Technology: Its New Meaning for Art* (New York: The Jewish Museum New York, 1970).

21   Stewart Home, Karen Eliot, Graham Harwood, Mark Pawson, Stefan Szczelkun, *The Festival of Plagiarism* (London: Sabotage Editions, 1989).

22   Claire Bishop, "Digital Divide: Contemporary Art and New Media," *Artforum*, September 2012, 434–42.

23   Armen Avenessian and Suhail Malik, "The Time-Complex: Postcontemporary," *Fear of Content*, IX Berlin Biennale, 2016, http://bb9.berlinbiennale.de/the-time-complex-postcontemporary/.

24   Walter Benjamin, "Experience and Poverty," in *Selected Writings*, vol. 2, part 2 (Cambridge, MA: Harvard University Press, 2005 [1931–1934]).

25   Drone cinema includes both drone cinematography, i.e., films shot from drones, and a type of film that, according to composer and curator Kim Cascone, "eschews narrative altogether and instead focuses on micro-movements within the frame: monotonal structures, monochromatic radiations, hypnotic ganzfelds, slowly changing blur fields, light beams filled with particles of dancing dust—i.e., tiny visual nuances that often go unnoticed by casual observers." Kim Cascone, "Drone Cinema Film Festival 2016," press release, Vrijplaats Leiden, 2016, https://vrijplaatsleiden.nl/agenda/drone-cinema-film-festival-2016-curated-by-kim-cascone/.

26   Roughly since the year 2000, there has been a technically informed critical engagement in critical software and new media studies, hacker culture, and related arts, although its practice has not always been successful.

27   Gene McHugh, "Post Internet," September 12, 2010, http://122909a.com/ (accessed through Internet Archive Wayback Machine).

## Not Art&Tech
### On the Role of Media Theory at Universities of Applied Art, Technology, and Art and Technology

I'm a net artist who has been active in the field for twenty years. For sixteen of those years, I have been teaching new media designers at Merz Akademie. I'm also a co-author of the book *Digital Folklore*, and since the beginning of this century I have been collecting, preserving, and monumentalizing the web culture of the 1990s. As an artist, researcher, and teacher I value user culture and medium-specificity in both design and research and as an everyday routine. I see my work as contributing to critical digital culture, media literacy, and the development of languages and dialects of new media.

But there are many obstacles in my way. Three years ago I grasped and boiled these obstacles down to three: technology, experiences, and people. I have nothing against any of these concepts unless they are used by hardware and software companies as substitutes for "computers," "interfaces," and "users."

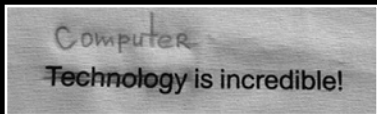Computers ⟶ Technology
Interfaces ⟶ Experience
Users ⟶ People

The situation is serious and these substitutions are happening on an epidemic scale.

In my essays "Turing Complete User" and "Rich User Experience," I trace the metamorphoses of the terms "users" and "interfaces" over time.[1] Here I would like to start to elaborate on "technology" and particularly why I resist the paired term "Art and Technology."

I should note that by defending the words in the left column, I always find myself in an unfortunate situation. First of all, because in our field you should always go for the newest term if you are unsatisfied with the current one—not go backward, at least not to the most recent past. Nobody wants to be called a "user." The effort to deface this word has been enormous and successful. Even when you understand that the term "people" coming from the tech industry's mouth constitutes pure hypocrisy, you would prefer to fight for your user rights by calling yourself a "digital citizen," not a user … though there is no digital city, state, or constitution.

I also find myself in awkward situations. For instance, I am now going to use an institution that I have a very close relationship with as an example. It is probably the only institution in the world that supports my work, because it is devoted to net art and its archiving: Rhizome at the New Museum in New York.

In 2015, during their community campaign, Rhizome released a nicely designed bag. If it had been made by any other organization, or if it were a bag of a size that did not suggest that its purpose was to carry a personal computer around, I would have passed it by, but that was not the case. So I vandalized the bag.

**Olia Lialina**

# Not Art&Tech

"Don't fall for the word 'technology,'" Ted Nelson concludes in the last paragraph of his book *Geeks Bearing Gifts*. "It sounds determinate. It hides the fights and the alternatives. And mostly it is intended to make you submissive."[2] He asks us not to accept computer technology as WYSIHA—his own acronym for "What You See is Wonderfully, Happily, Absolutely Mandatory"—but to see its tensions, history, and alternatives. His is an important call, but only one third of the argument I have against the term technology.

Submission is one issue, but sedation is even more important. "Technology" as a replacement for digital technology or computer technology, which are in turn already substitutes for "programmed systems," is a figure of speech known as synecdoche: in this case, when the whole of an entity is used to refer to one of its parts.

Synecdoche is a rhetorical trope that makes the computer dissolve into all other technologies, becoming an invisible part, just one of many. This is in the interest of the industry, because it makes users unaware of the computer as a system that is programmed, that can be reprogrammed at any moment, and that could potentially be programmed or reprogrammed by its users.

There are (re-)programmable technologies and many others that are not programmable. But constant repetition of the word "technology" instead of "computers" sedates us and makes us forget that the system we hold in our hands is a programmable one.

Another good reason to say "technology" instead of "computer" is that—they say—computers are inside almost every piece of technology, or, as Kevin Kelly writes in his book *What Technology Wants* (not recommended reading, but I can't avoid mentioning it here), "these days all technology follows computer technology."[3]

At the end of the day, technology is being explicitly used as a new word for computer—not for all technologies including digital ones, but explicitly digital ones. So the purpose is to avoid saying "computer." Indeed, technology is not a synecdoche, but a euphemism.

"It's time to give up this talk of 'Technology' with a big *T* and instead figure out how different technologies can boost and compromise the human condition." Evgeny Morozov makes this rare constructive suggestion in his sour essay *To Save Everything Click Here*.[4]

It is tempting to agree, but I would argue again that both Technology with a big *T* as well as technologies with a small *t* should be replaced by "computer," with whatever size of *c*. I know "computer" is an abstraction as well, but it still connotes algorithmic powers, programmability. It describes what is really happening within society, culture, and the arts.

Rhizome's most successful event is its "Seven on Seven." The promotional text says: "the Seven on Seven conference pairs seven leading artists with seven luminary technologists, and challenges them to make something new together—be it an application, artwork, provocation, or whatever they imagine—over the course of a single day."[5]

Technologists are people of different backgrounds, including art, or at least artistic ambitions, who have

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something in common. They can program or—more often lately—they represent the software industry.

Art and Technology as of today, or even "Art&Tech"—a term I learned about in early 2014 while reading articles reporting on both Seven on Seven and the monumental exhibition "Digital Revolution" at the Barbican in London—is not a revolutionary art form or an artistic movement. Art&Tech is, like "technology," a figure of speech. It swiftly replaces Computer Art, Digital Art, and Media Art. Art&Tech alludes to the almost fifty-year-old Experiments in Art and Technology (E.A.T.) program of the Los Angeles County Museum of Art.

In 1967, E.A.T. was promoted as a project in which art would bridge the worlds of technophobes and technophiles; art would enter the world of engineers, "working with materials that only industry can provide."[6] Contemporary art institutions love Art&Tech as a brand because it gives a strong connection to E.A.T., which is both history and establishment, and is a celebrated example of artists collaborating with West Coast industries.

The next epochal seventy-artist group exhibition, which I am in, will take place 2016 at the Whitechapel Gallery in London. The title is "Electronic Superhighway," a term coined by Nam June Paik in 1974, but the show IMHO artificially extends the history back to 1966, to include artifacts of E.A.T., and therefore to be less media/computer/internet and more "tech."

**"Technology" sedates. "Art&Tech" beams loyalty.**

***

Siegfried Zielinski writes: "Terms are the frameworks of abstraction, which we need for thinking and

acting in ways that are interventions. The definitions that we make should satisfy two important criteria. They should be of a provisional character and should be open enough to allow further operations."[7] However, "Technology," though it sounds open enough, is at the moment a term that turns scaffolding into a fence, *Gerüste* into *Rüstung*. It disarms those who would want to approach the field critically.

The spreading of the word technology reminds me of (but does not equate with) the shift that happened fifteen or twenty years ago, when "digital computer" or "digital medium" was substituted by "new media." In 2000, Janet Murray optimistically interpreted this process in her introduction to *The New Media Reader* as "a sign of our current confusion about where these efforts are leading and our breathlessness at the pace of change, particularly in the last two decades of the 20th century."[8]

The breathlessness has gone along with the century: new media evangelists became angry men; new media optimist turned into skeptics. Sherry Turkle—who, in 1984, believed or transmitted the idea of one of her respondents in *The Second Self*: "If people understand something as complicated as a computer, they will demand greater understanding of other things"—ends *Alone Together* thirty years later with the words: "it is we who decide how to keep technology busy, we shall have better."[9]

As Zielinski points out in his introduction to *After the Media*, "the promise that the media could create a different, even a better world seems laughable from the perspective of our experience with the technologically based democracies of markets."[10]

Along with "the better world," which has turned into "making the world a better place" (every second start-up's objective); along with

computers turning into invisible computers, and media arts into Art&Tech; and along with the rise of technology as the invisible computer; research in media, new media and media theory itself has been going through difficult times.

"Through the monumental exertions of the twentieth century, [media] have also become time-worn," Zielinski concludes.[11] *After the Media* belongs to a growing number of texts that elaborate on the situation in which media theory finds itself in the position of "after," "post-," "not," or simply in the past tense.

*After Media*, *Media After Kittler*, *Media after Media*, and *Anti-Media*. Post-digital, post-#occupy, and post-PRISM. "What were Media" (*Was waren Medien*) was an important event and publication organized by Claus Pias at the University of Vienna in 2006/07—almost decade ago—as was the 2007 transmediale conference with the panel "Media Art Undone." The latter was also the moment for me personally to give up and claim to never talk about the difference between media art and net art publicly.[12] I didn't know that some years later I, as a net artist, would be confronted with post-internet.

Words are important. There is a huge gap (or at least a possibility for one) between "after" and "post." Post is loaded with crisis, rejection, and the urge for action. After is fatigue and exodus—but not only. It is also a change of perspective to a bird's eye view, a chance to grasp from the outside what was happening around you or even built by you before.

Jussi Parikka writes in his postscript to *Media After Kittler*: "just when we were supposed to reach the peak excitement about media technological innovation—the biggest innovation revealed to be about its disappearance."[13]

Well, it was neither a conspiracy, nor a sudden turn, nor *force majeure*.

***

The hidden aspects of the media are the things that should be taught, because they have an irresistible force when invisible. When these factors are ignored, remain invisible, they have an absolute power over the user. —Marshall McLuhan[14]

We believe technology is at its very best when it's invisible, when you're conscious only of what you're doing, not the device you're doing it with. An iPad is the perfect expression of that idea. It's just this magical pane of glass that can become anything you want it to be. […] It's a more personal experience with technology than people have ever had. —Official Apple (New) iPad trailer, 2012

Media theory situated in applied arts can be seen, on one hand, in a meaningful and pleasant neighborhood. Who, if not media designers and media and transmedia artists should be interested or be made interested in the ways media becomes the message and defines the situation? Who, if not they, are to be nurtured with media theory's ideas, and give back in the form of artworks, artistic research, and designs?

At the same time, it is not a peaceful situation. On the contrary, it may be the most challenging neighborhood for media theory, because (if the curriculum is balanced and up-to-date) students have to learn the origins of digital culture and computer science, to read Vannevar Bush, J. C. R. Licklider, Alan Kay, Alan Turing, Joseph Weizenbaum, and Don Norman, those who conceptualized and theorized digital media.

New Media Art departments —for media studies—are not just places where theory meets praxis, or where media theory meets media

praxis (and art meets tech), but where two theories meet each other: two traditions, two schools of thought. One is all about revealing, and the other about hiding. The quote from McLuhan's interview above is from 1977, and Apple's ad is from 2012. My collage of both can be read as as now and then, theory and practice, but keep in mind that while McLuhan, Alan Kay, and Adele Goldberg are all writing, they are not prototyping —they are conceptualizing a meta-medium. In the same period as McLuhan, Don Norman, a doctor of philosophy and a cognitive scientist who is today known as the father of user-centered design, criticized the philosophy of Unix, and was already working on a paradigm that would result in computers becoming invisible technology.

So, what to do with this clash of theories, concepts, and intentions, apart from using students' heads as magic pots where they would melt into a brilliant project or text?

If you ask me, the big task for media theory today is confrontation. Not analysis of the media of today, but questioning the assumptions on which they were built and taking care of the generation who could rebuild them.

Media theory, with its half-century of experience and its toolbox of ways to reveal the hidden, could take a leading role in educating people who can change the paradigm of media. What I argue for is reversing the "practical turn," to examine the concepts and theories underlying the practice. For example: to question Licklider's postulates on what computers can do best and suggest models different from human-computer symbiosis; to argue for ambiguity in software architecture; to question "variability" and "automation" as principles of new media; to establish another counter-paradigm: "The computer of the future should be

visible." This is the main topic on my agenda for media theory.

* * *

Now, to the more obvious matter: theory and practice.

Media theory and media artists are close colleagues. We appear in the same exhibitions and publications; we share panel sofas.

What would "post-digital," as a philosophy, do without "post-internet" as phenomenon? What would net criticism do without net artists? The artists are the ones who conceptualize the field and are still busy reconceptualizing it.
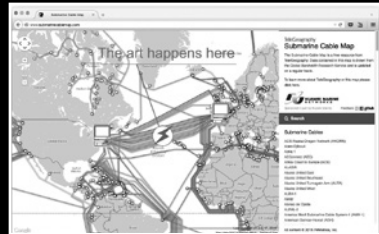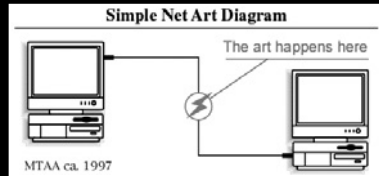


Above are MTAA's 1997 *Simple Net Art Diagram*, which called attention to the true spirit of net art through Rick Silva's 2004 response to it (*Complex Net Art Diagram*), and a map by Evan Roth from 2015 (*Art Happens Here*), which shows a strong or even hypertrophied emphasis on the physical, material, hardware in today's net art scene.[16]

From its earliest days, media theory and cultural theory had very warm feelings toward artists. Theorists count on artists as being the first to explore and make sense out of new media, or the most powerfully

resistant to it. They look at artists' work in search of arguments for their theories (which I think have caused some misconceptions in new media). Critical thinkers of all schools look with hope at creative minds.

On the last pages of his aforementioned book—which made fun of every division of Silicon Valley and every previous attempt to criticize it—Evgeny Morozov makes an effort to be optimistic, turning his attention to artistic experiments with the "Internet of Things." Even the most disillusioned are ready to be charmed by Art&Tech.

> And new codes are being elaborated. And one of the most important codes is the code of technical images. So I came to Osnabruck to look at what those people are doing.
> —Vilém Flusser[17]

> "So, what do you got?"
> "OK, here it is. Bit Soup. It's like alphabet soup, but it's 1s and 0s instead of the letters. Because it's binary. You know, and binary is just 1s and 0s."
> "Yeah, I know what binary is! Jesus Christ, I memorized the hexadecimal times tables when I was 14, writing machine code, ok? As me what 9 times f is? It's flevendy-five. I don't need you telling me what binary is, just like I don't need you thinking about soup or taking pictures of it. I need you thinking about apps, software, web sites. This is Silicon Valley, all right? Not … [checks phone] Paris, Texas. That's where Campbell's Soup is."
> —*Silicon Valley*, Season One, Episode One[18]

> "What do those do who sit in front of the computers, who are pressing keys and who produce lines, surfaces, and bodies? What

do they really do? They realize possibilities," writes Vilém Flusser in *Digital Apparition* (*Digitaler Schein*).[19]

The realization of possibilities (*Verwirklichen von Möglichkeiten*) that Flusser so generously assigned to programmers or users of computer programs twenty-five years ago should be seen as instructional. It could become a core for any new media curriculum. The question, though, is what kinds of opportunities students should take. How to resist both the "bit soup"—perpetual flirting with the digital—and the demand for "apps!" by the Art&Tech market?

At the very moment I was writing this text, a message arrived in my inbox: a petition from a few young and a few established media artists and media-literate art institutions:

> Dear Apple, Bring art to the world and the world to art! Please add an "Art" category to the App Store.

In my picture of the world, if media artists are to interact with Apple, the main if not the only thing they have to demand is the closing of the App Store. So I made some sarcastic tweets and even drew a caricature:



But it seems my irony was too covert and the picture too cryptic, so my response was interpreted as support for the campaign. While I was busy

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Firewall

Hiding Place

Neighbor's House

Floor

Viewing hole

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XIII
XII
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PONY EXPRESS ROOM (E)

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CHIMNEY ROCK ROOM (C)

OREGON TRAIL ROOM (D)

PIONEER ROOM (F)

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RA decoder

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DEC motor

DEC decoder

Filter position

Filter orientation

DSP

Specimen

Stage

Focus Optos...

Ocular Lens

Coarse Focus

Objective Lens

Coating Focus

Coarse Focus

Fine Focus

Objective Lens

Stage

Specimen

Light

PC (Linux)

RED ZONE

KNOTHOLE CLUB

BOX LODGE SEATING

Superstructure

Substructure

Infrastructure

PSI Ticketing RS/6000

Local Area Network

Web Browser

Server

Leafter

cathode

oil bath

electron beam

filter

vacuum

X-ray beam

tungsten anode

motor

Internet

Net.Commerce NT Server

$s^{14}$  $q^{14}$  $p^{14}$

$y^{14}$  $v^{14}$  $z^{14}$

$a^{10}$

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$x^{9}$

$z^{8}$

$z^{7}$

$z^{6}$

$z^{5}$

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with my tweets and angry image manipulation, terrible things were happening in Paris: the attacks on November 13, 2015. The next morning was all about accumulating news and tracking friends.

I asked my daughter, who was studying in Paris last year, if she had heard anything from her friends. "Almost everyone is marked safe," she said. Facebook's new feature for regions hit by natural disasters, which automates the possibility to check that your loved ones are okay, was turned on after a terrorist attack for the first time. This act brought Facebook many likes, but also criticism. Users from Lebanon wanted to know why the safety mark was not activated some days earlier, when attacks happened in Beirut. They asked to turn it on, and shortly after Zuckerberg excused himself and had it enabled.



In no way do I want to compare Beirut's demand to turn on this feature with media artists' appeal to turn on an Art category in App Store. I also don't want to compare it to the frustration Russian Facebook users are expressing now in their microblogs: asking why the French tricolor is available as an avatar decoration to show support, but no Russian flag theme was there when the Russian plane exploded in mid-air over Egypt.

But formally these events are similar: people around the globe are appealing to Silicon Valley for features and for justice.

In *Media After Media*, Bernhard Siegert notes that "the concept of media has become completely identical with interfaces and digital objects that can be manipulated on the

screen."[20] This is a correct observation and one can only add that those interfaces are provided by three, maybe five, companies.

By researching or critically approaching media or "technology," we are in fact researching Apple, Google, and Facebook, their algorithms, their interfaces, and their pragmatic and aesthetic decisions.

* * *

<u>We know that an algorithmic object or construct, a computational thing, has the power to enact certain forms of reality. It constructs things around itself, like any object or design. Technology has power to enact cultural, social relationships. So digital subjects may enact certain forms of subjectivity, but the subjectivities they enact are not *you*. You produce something, you generate data, and then this digital subject is aggregated outside of you and produces something else in return, but it is not you either.</u>
— Olga Goriunova[21]

In fall 2015, the event "Algorithmic Regimes and Generative Strategies" took place at the Technical University of Vienna. I could only attend it online. So as not to confront you solely with the ideas of big dead men, I have chosen to end with a few seconds of Olga Goriunova's lecture at that conference, in which she raised the question about the "digital subject," "data double," or, one could say, the "second self" of our times—identities as generated by algorithms.

I merged it with a video that makes use of Google's Deep Dream, the image-classifying algorithm that sees dogs everywhere. This past summer's visual mainstream looks like a dream by Timothy Leary and reads like Donna Haraway's scenario of chimeric machine-animal fusion.

YouTube changes its interface every other day; Facebook rolls out global changes once in a while. Both routine and revolutionary change provide food for thought, constantly, and not only among theoreticians, but everybody. Today everybody is a little McLuhan interpreting the messages of the media. What did Twitter mean when it changed stars to hearts? What does Google mean with dogs?

Google's algorithm sees dogs everywhere because it was trained to recognize dogs. Some questions have simple answers. It is practically impossible to find answers to serious questions like "what is the digital subject"—even formulating those questions is a noble task, because rules, algorithms, and terms change on fly.

And when it comes to teaching media artists and media designers, how should the questions be formulated? What can be used to excite and provoke students? To the agendas I

have mentioned before, which include empowering students to change the invisible computing paradigm and refusing the "opportunity" of Art&Tech, let me add another one:

To take time to formulate questions that cannot be answered by monopolies or by observing monopolies.

1   Olia Lialina, "Turing Complete User," Contemporary Home Computing, 2012, http://contemporary-home-computing.org/turing-complete-user/ (accessed September 22, 2016); Lialina, "Rich User Experience, UX and Desktopization of War," Contemporary Home Computing, 2014, http://contemporary-home-computing.org/RUE/ (accessed September 22, 2016).
2   Ted Nelson, *Geeks Bearing Gifts* (Sausalito: Mindful Press, 2009)**, 196.**
3   Kevin Kelly, *What Technology Wants* (New York: Viking Press, 2010), 159.
4   Evgeny Morozov, *To Save Everything, Click Here* (New York: Public Affairs Books, 2014), 323.
5   "About Seven on Seven," *Rhizome*, http://sevenon-seven.rhizome.org/ (accessed September 20, 2016).
6   Maurice Tuchman, *A Report on the Art and Technology Program of the Los Angeles County Museum of Art*, 1967–1971 (New York: Viking, 1971), 11.
7   Siegfried Zielinski, *[…After the Media]*, trans. Gloria Custance (Minneapolis: Univocal Publishing, 2013).
8   Janet Murray, "Inventing the Medium," in *The New Media Reader*, eds. Noah Wardrip-Fruin and Nick Montfort (Cambridge, MA: MIT Press, 2003), 3.
9   Sherry Turkle, *The Second Self: Computers and the Human Spirit* (Cambridge, MA: MIT Press, 2005), 296; *Alone Together: Why We Expect More from Technology and Less from Each Other* (New York City: Basic Books, 2011), 296.
10  Zielinski, *[…After the Media]*.
11  Zielinski, *[…After the Media]*.
12  Lialina, "Flat Against the Wall," 2007, http://art.tele-portacia.org/observation/flat_against_the_wall/ (accessed September 22, 2016).
13  Jussi Parikka: "Postscript: Of Disappearances and the Ontology of Media (Studies)," in *Media After Kittler*, eds. Ikoniadou Eleni and Scott Wilson (London: Rowman & Littlefield International, 2015), 178.
14  Marshall McLuhan, "The Medium Is the Message," lecture, ABC Television, June 27, 1977.
15  TouchGamePlay, "Official Apple (New) iPad Trailer, YouTube video, posted March 7, 2012, https://www.youtube.com/watch?v=RQieoqCLWDo.
16  MTAA (M. River & T. Whid Art Associates), digital image, 1997.
17  Vilém Flusser, "On Writing, Complexity and Technical Revolution," Interview by Miklós Peternák in Osnabrück, European Media Art Festival, September 1988, https://vimeo.com/164799522.1988.
18  *Silicon Valley*, "Minimum Viable Product," Season 1, Episode 1, Mike Judge, HBO, April 16, 2014.
19  Vilém Flusser, "Digital Apparition" in *Electronic Culture: Technology and Visual Representation*, ed. Timothy Druckrey, trans. Andreas Broeckmann (New York: Aperture 1996), 242–45.
20  Bernhard Siegert, "Media After Media," in *Media After Kittler*, eds. Ikoniadou Eleni and Scott Wilson (London: Rowman & Littlefield International, 2015), 85.
21  Olga Goriunova, "Data Subjects," lecture, Algorithmic Regimes and Generative Strategies, Technical University, Vienna, September 25, 2015.

## B. Interventions

The transmediale festival and its various networked projects have long operated with an awareness of the lineage of critical net culture. From video activism to tactical media and conceptual performances, transmediale has experimented with ways to bring disruptive practices into an institutional or semi-institutional context, leading to an ongoing reorientation of the institution itself over time. This entails zooming in and zooming out: while the practices elucidated in this section are of course specific to their time and place, their potential as interventions is dependent upon their making expansive interconnections.

Creativity and critique can and must be understood outside of the framework of the creative industries and "innovation" rhetoric. For this reason, collective, political, and activist uses of technology are foregrounded in this section. The role and shape of interventionist creative practice come under debate, as does, crucially, the place of subjective, individual experience within institutional contexts mired in vast and often oppressive economic and political structures. How does the individual intervene in networks of power? How does the small intervene in the big? Should the small become bigger, or resist the imperative to expand?

The notion of intervention has multiple associations: Relational Aesthetics, institutional critique, and situated art practices such as Land art; Dadaism, readymades, and Fluxus; media activism, hacker and maker cultures. While all these references come into play in this section, the focus falls on a contemporary notion of the commons, which imagines interventions not (only) as singular events or movements, but as long-term reappropriations of agency and property—intellectual and material.

Today, intervention is not often discussed in terms of subversion, because, as is expressed in this section, subversive tactics have repeatedly been coopted by structures of power. Yet in a time when push-and-pull opposition is no longer identifiable and may rarely be possible, rigorous analysis of radical interventionist experiments is an urgent task. By surveying and juxtaposing the many faces intervention can take, this section asks what it takes to puncture supposed static or unchangeable realities, and challenges art and activist practices to go even further.

Tatiana Bazzichelli

# reSource: A Year-Round Festival Program

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Within the framework of curatorial and networking practices beyond the realm of the digital, this essay aims to reflect upon the experience of reSource transmedial culture Berlin, the series of transmediale-related projects and network activities that extended the festival program throughout the year, in the time frame of 2011 to 2014. The development of a year-round festival program was based on the idea of creating a shared knowledge laboratory within transmediale, as well as a project for local and trans-local distributed networks active in Berlin and elsewhere. Reflecting on the changes introduced by the digital paradigm into everyday life, and therefore applying a post-digital perspective able to open analysis to broader social, economic, political, and artistic landscapes, the objective was to involve communities that not only engaged directly with network technologies, but also critically working on decentralized and distributed strategies of participation and collaboration. These ranged from artists, hackers, activists, and independent cultural producers, to feminist, queer, and porn communities.

Since I was also part of the transmediale team as program curator between 2011 and 2014, my analysis contains both a situated perspective and a meta-reflection on the subject of community building in relation to festival program development. Motivated by the necessity of describing a networked curatorial path by positioning myself *within* the matter under scrutiny, I defined my practice-based approach as an "ethnography of networks"—a methodology that I have tested in the past when writing about Italian and international hacker and activist communities since the late 1990s.[1] Applying a methodology in which the theoretical imaginary is closely linked with the act of experiencing the research subject itself, I involve myself directly in the development of its analysis and concrete challenges. Therefore, my perspective aims to bypass the theoretical mediation of the traditional curator given the fact that I was individually situated within the transmediale

team as program developer as well as within the reSource community as a networker.

This contribution is an initial attempt to investigate and to reflect upon the idea of introducing a changing element into the consolidated structure of an art festival with around thirty years of history. The development of the network program had evident consequences on the festival team's structure, the program planning, and the perception of the festival's activity in the local and trans-local context of Berlin. This analysis is especially directed to those who would like to imagine new modalities of expanding a festival program into a yearly activity, by directly addressing local communities of artists, activists, and cultural producers working across art and digital culture. Furthermore, I would like this analysis to serve as an invitation for those who have been part of the reSource experience to reflect on a wider scale upon the process of applying a networking methodology to a consolidated festival structure, opening up a collective discussion about what could be repeated and what instead should be avoided in the future of this and similar projects.

IMAGINING A "TRANS-MEDIAL" RESOURCE

The development of reSource transmedial culture berlin followed a curatorial vision of crossing artistic practices and languages with a critical reflection on media culture, connecting the reSource program planning with the general curatorial development of the transmediale festival. The activities of the reSource program developed through organization of events involving artists, hackers, activists, researchers, and cultural producers active in Berlin and elsewhere throughout the year, with touchdowns at each festival.2 Alongside this, the reSource initiative was imagined as a distributed networking platform as well as a theoretical investigation into the meaning and the practices of networked art, hacking, and collaborative art production in the context of an international art festival. Within the process of community building, we wanted to experiment with an ongoing curatorial methodology related to festival program development, as well as to imagine a festi-

val as a sharing resource for a broader community in Berlin and beyond.

The theoretical aim was to go beyond the hype of the technological or the digital paradigm, to focus instead on the hybrid interconnections between art and culture in everyday life, blending together various media and disciplines—following a path initiated decades ago by the Fluxus movement and earlier avant-gardes, and analyzed by a wide range of thinkers.3 But while many Fluxus artists aimed to bring everyday life into the art field, many countercultural artistic projects in the late 1970s and 1980s aimed to transfer artistic practices into everyday life, as well as to question what the notion of "everyday life" is. In the development of the reSource project, one of the initial conceptual challenges was how to bring a festival perspective into the "everyday life" of the independent art and post-digital culture scene of Berlin, a scene that is very fragmented and often critical toward the dynamics of "big events."

This generated not only a structural problem, as until that time the festival had been conceived primarily as a once-a-year event, but also a political problem, concerning the risk of imposing a top-down structure onto a wider independent community. A conceptual interrogative that I posed for curatorial debate within the transmediale team was why a festival like transmediale evolved in the city of Berlin specifically, and what this might mean for its collective representation.4

In the past I have described the city of Berlin as a kind of modern Eutropia, referring to the 1972 book *Invisible Cities* by Italo Calvino: "Berlin/Eutropia is the city that changes constantly, and constantly remains the same. For many, it is the city of fluxes, of the precariousness and the temporary. But it is also the city where the precariousness and the temporary are the normativity, they repeat themselves over and over, taking different forms in the illusion of progressive movement, from decade to decade."5 Within a festival that goes "across and beyond" by connecting various media and culture—a transmedial festival—the challenge became how to reach and address the mobile and dynamic facets of the city in which the festival operates. Given that Berlin is a city of interconnec-

tions, where artistic, medial, political, and economic flows intertwine, the main questions became how to bring the local dimension of the city into the festival and expand it internationally, as well as how to bring the international dimension of the festival into the local city context.

The curatorial aim behind the conceptualization of reSource transmedial culture berlin was to merge interdisciplinary trajectories, opening up the program to artistic, political, economic, and bodily practices. Applying a post-digital perspective to the creation of a networking path, the actual "resource" that the festival wanted to offer was the creation of contexts for sharing, exchange, and discussion involving hackers, activists, artists, cultural producers, academics, and researchers, as well as project spaces—the complex diversity of the free and independent Berlin scene. The main challenge became not only structural but also political: reSource aimed to create a change within the festival's production, also according to the traditional vision of a festival program, generating a distributed and year-round project, able to innovate when it came to the format of the festival as well as the perception of what a festival needs to produce and create in the city landscape, a problematic that I will analyze more deeply at the end of this essay.

## THE NETWORKING-RESEARCH-CURATING APPROACH

reSource transmedial culture berlin started as an initiative able to extend into ongoing activities with decisive touchdowns at each festival. The general direction was to organize events, talks, workshops, performances, and constellations of activities, intercrossing the program of the festival. The reSource program started in September 2011, with the aim of questioning and transferring into practice the concept of "Networking-Research-Curating." This methodology expanded the festival production, interconnecting different fields of theory and practice: reflection on experimental modalities of networking and community building, research on disruptive artistic and activist practices within the post-digital framework, and a distributed curatorial

approach based on the creation of a process rather than only the production and presentations of selected artworks.

The first public introduction of the reSource project was the formulation of a statement of interest in October 2011, while planning the series of talks at transmediale 2012.[6] The statement introduced the reSource activity to the general public, and posed some specific objectives, according to the theoretical perspective of shifting from the digital paradigm, to post-digital practices related to the broader landscape of society, culture, politics, and everyday life.[7] Starting from the assumption that the increasing commercialization of sharing and network practices has transformed the meaning of art and participation, the main questions in the statement were directed to artists, activists, hackers, and cultural producers working with the idea of networking through a critical lens.

Pointing out that hacker and artist practices have developed in response to deep transformations in their participation contexts, often reflecting cultural and economic precarity, the statement asked about the responsibility and the role of cultural institutions engaging with art and digital technologies. Assuming that in past decades in Berlin, hacker, activist, and artist practices have mostly been realized outside the realm of artistic institutions, the statement highlighted the fact that those practices have contributed to transforming the city's economy and cultural assets, and have also become easy targets for market exploitation. In a context in which financial markets deeply influence the development of cultural production and, more generally, of daily life, the question became how to encourage direct participation and common engagement without replicating pervasive business logics and hierarchical forms of control.

From the outset, the questions posed by reSource transmedial culture berlin reflected the need to analyze the topology and the effects of artistic and hacktivist practices in decentralized social networks, while remaining conscious that a distributed networking phenomenon might bring along contradictions and ambiguities. This implied a reflection on power structures and business methodologies as well as on the relationship between art and network economies. The research that formed the ba-

sis of the reSource project generated an analysis of disruptive hacker and artistic practices in the field of network culture, but also a deeper investigation into networking as a research method. Following my path of research on these topics, I pointed out that it was necessary to rethink concepts such as innovation and disruption, co-optation, and opposition as mutual feedback loops where various subjects involved in the process reciprocally influence each other.[8]

Within the framework of this research, an important aspect was to encourage mutual exchange of methodologies and knowledge, as well as project space experiences, investigating new ways of forming a cultural public and reflecting on the curatorial activity of the transmediale festival. This scope informed the first plenary meeting, with curators and cultural producers at Berlin's General Public project space during the event *reSource 001: Trial Crack* in May 2012. After this event, according to a proposal by Panke e.V. and Art Laboratory Berlin, this transdisciplinary approach was further developed in monthly reSource network meetings, hosted by various project spaces and curators in Berlin — which have been taking place regularly ever since. In August 2012, the outcome of the reSource activities was the creation of a network platform (the reSource-net mailing list) with the goal of encouraging the sharing and development of experiences, questions, and issues of artistic and other communities within (and beyond) digital cultural production.[9]

One of the results of the exchange with project spaces and local cultural producers was the publication in September 2013 of the *reSource Chats*, a series of interviews within the initiative "Networking Berlin's transmedial culture."[10] The *reSource Chats* project was a creative montage of interviews with various culture producers and managers of local spaces in Berlin. After the transmediale 2012 festival, I had started investigating the perception of the newborn reSource project, and the transmediale festival in general, among various cultural producers, artists, and curators based in Berlin. The aim of the interview project that grew out of this investigation was to document the considerations and thoughts of people active within the scene of cultural production in the city, and the im-

plications of their activity in the framework of cultural politics and networking models. The project highlighted the strengths and weaknesses of the condition of being trans-genre in the cultural landscape of Berlin, focusing on the hybrid character of activities that mix media, practices, and languages, which often lack political and cultural recognition as well as sustainable funds.[11]

The curatorial choice to develop the reSource as a networking process was also the reason behind connecting the reSource project with the Vorspiel production, the partner program of transmediale and CTM festivals. The scope was to generate an open platform for interconnection among local spaces, encouraging resource sharing and mutual visibility. Vorspiel promoted digital and post-digital culture among independent organizations, project spaces, galleries, and other venues across Berlin, strengthening the network among such actors. The strategy was, therefore, to produce the Vorspiel as the result of a process of networking, by creating a context of sharing and synergy among the reSource network, or close to it — as opposed to merely a consequence of a selection of projects and artworks operated within the festivals. This process resulted in the event *reSource 003: P2P Vorspiel* in February 2013, and was further developed in the following Vorspiel events — a series of distributed activities throughout the city prior to and during the transmediale and CTM festivals.

RESOURCE AS ONGOING ARTISTIC PRODUCTION

During the development of reSource transmedial culture between 2011 and 2014, one of the challenges was to configure the project as a laboratory for artistic production, not only working on the creation of specific artworks to be presented at the festival, but especially on the process of networking and distributed interventions based on long-term relationships between the festival and the community of art and (post-)digital culture. During the summer of 2012, I worked on the organization of the practice-based conference and event *reSource 002: Out of Place, Out of Time*. The event took place from August 22–24, 2012, at Kunstraum Kreuzberg/Bethanien,

and presented open discussions, panels, workshops, and performances, shedding light on the practices of artists, activists, and hackers rethinking critical interventions in the field of art and technology. The organization of this event was preceded by in-depth research on networking practices, giving attention to analog processes of networking (networks out of time) and the idea of shifting cultural paradigms via network technologies (networks out of place). The three-day event reflected on modalities of artistic production in the framework of digital culture and network economies, while generating a collective insight into the themes of the upcoming transmediale and CTM festivals.[12]

The event was also the occasion to launch three major installation projects, which were developed in the following months and presented at transmediale 2013. The first was *OCTO P7C-1* (with the related mail art project *PNEUMAtic circus*), which resulted from a collaboration between reSource, transmediale, the Berlin-based art collective Telekommunisten, the Berlin-based architecture group raumlabor, and a network of more than a hundred international mail artists, both as a living metaphor of a social network and as a tribute to the local Berlin *Rohrpost* (a public service of pneumatic-tube transport created in 1865). The second was *ReFunct Media 5*, a circuit-bending installation made of obsolete technologies, exhibited in the Haus der Kulturen der Welt during transmediale 2013, an ongoing collective project that began in August 2012, generated from a Minitel hacking workshop directed by Benjamin Gaulon and Karl Klomp; *Composting the City / Composting the Net*, an art installation project by Shu Lea Cheang, processing discarded food scraps and the immaterial junk of net data, involving a local network of people that—after maintaining a collective composter for six months—came together for a live performance at transmediale 2013.[13]

Proposing an input and practice-based "testing" of the upcoming festival topics, the event created a distributed trans-genre program involving various artists, hackers, and performers from local and international networks.[14] This interdisciplinary, trans-local approach was at the core of the subsequent reSource events during 2013, in which we aimed to connect local debate

with the emerging international issues around whistleblowing.[15] The events had a curatorial follow-up at transmediale 2014 in the conference thread "Hashes to Ashes," an opportunity to reflect on patterns of intimidation to threaten and silence whistleblowers, cyber-activists, and journalists by discussing the future of political agency, free speech, and freedom of information.[16] This critical reflection on post-digital society was further developed in the last event of the *reSource 00+* series, which took place again at Kunstraum Kreuzberg/Bethanien with the title *reSource 006: Overflow* from September 12–14, 2013. The event highlighted various strategies for rethinking digital and physical spaces, analyzing issues related to data overflow, such as ownership and privacy, and the way complex data is distributed and shared—topics that informed the debate around transmediale 2014. The condition of "overflow" also shed light on the growing desire to be part of an extended, connected collective, imagining conscious strategies of networking, communication, and grassroots participation.[17]

The methodology of the *reSource 00+* series was to encourage an interconnection between grassroots initiatives of the art and digital culture scene of Berlin and transmediale festival, by producing some of them within the festival itself. The idea was to develop a laboratory of experimentation able to influence some curatorial paths of the festival, by creating a confluence between reSource and the transmediale festival in general. This generated great results through the above-described projects at trasmediale 2013 and 2014, but also some political and structural challenges related to the networking process both inside and outside the festival.

TRIALS AND ERRORS IN BERLIN'S LANDSCAPE
OF CULTURE PRODUCTION

One of the main objectives of the reSource program was to act as a link between the cultural production of art festivals and collaborative networks in the fields of art and technology, hacktivism and politics—with the aegis of facilitating collaboration and sharing resources and knowledge between the transmediale festival and the local and trans-local scene

engaged with art and digital culture in Berlin. The reSource project worked on many layers of conceptualization and curatorial development and involved widely diverse actors: the transmediale festival team members who work during the whole year, the additional festival team members that are temporarily employed when the festival approaches, the institutional cooperation partners of the reSource project, and the community of art and digital culture in Berlin, which is involved in the monthly network meetings and takes part in Vorspiel partner events. reSource worked toward the formulation of a distributed and networked curatorial festival strategy, as well as the creation of tangible and concrete activities across the city, able to expand the festival throughout the year. Thus, operating within a high degree of experimentation, the trial-and-error methodology embedded in the curatorial development of reSource has been evident ever since its name was chosen. As I wrote in the initial statement of interest in October 2011:

> If a source is the beginning, or origin of something, reSource is used in this context as a starting point from which a distributed sharing process, and a common executable (artistic) program, is produced. The aim of the reSource for transmedial culture is to be distributed in a form that extends into an ongoing, year-round activity with touchdowns at each festival. This form includes both its executable files, and its source code. Source codes are useful to modify a program or understand how it works. Taking this notion more broadly, in the framework of the reSource for transmedial culture, the objective becomes to develop a networking distributed platform and an (executable) meta reflection on the meaning and the practices of networked art, hacking and collaborative art production within the context of an international art festival.[18]

From its beginning, the project proposed a "guess and check" curatorial approach. As a conceptual experiment, a "trial crack" was proposed. This is where the first collective event in May 2012 got its name. The first day of *reSource 001: Trial Crack* proposed a collective discussion on networking

methodologies of curating and distributed logic of artistic production with cultural producers based in Berlin. We discussed the responsibility and the role of cultural institutions engaging with art and digital technologies, toward a critical articulation of cultural production. Together with other active groups in Berlin's independent cultural context, we discussed ideas about how to build a stronger connection between local—and trans-local—agents in the fields of critical media, art, and hacktivism in the city. The same networking approach informed the following reSource network meetings, which, as previously mentioned, have been regularly and spontaneously arranged by the members of Berlin project spaces ever since.

Many of these network events worked well as platforms for sharing and reflection on the problematic matter of getting connected in a city with many concurrent events. Through those encounters, long-lasting relationships among some project spaces flourished and are still producing positive results. It was possible to get more closely in contact with the diverse and fragmented scene of project spaces in the city and to generate occasions of exchange among cultural producers, artists, and curators. Alongside this, the establishment of the Vorspiel program helped give more visibility to project spaces both new and recognized in the city—even if in general the plan of concentrating distributed events within a small time frame created problems of clashing programs and difficulties with simultaneous participation in both activity streams.

The reSource program had positive outcomes in connecting people and offering an ongoing festival presence outside the event itself, in dialogue with the city context. However, the process of establishing a year-round program operating both locally and internationally, respectively as a network of local agents as well as a curatorial series of events taking place prior to and during the festival, opened up various questions related to grassroots engagement, hierarchy, and sustainability. What is the role of festivals in the ecology of art production? How can festivals open new creative avenues? What is their role with regards to the communities they engage? How do we measure their community impact? Is it sustainable for a festival to work simultaneously on a local program as well

as on an international event? What is the benefit to independent project spaces of cooperating with a festival beyond the obvious plus of acquiring more visibility?

Answering these questions is complex. Writing from my own situated perspective between 2011 and 2014, as a networker and facilitator of the reSource network, as well as a curator of the transmediale festival, I often experienced the problem of being between and across two different contexts with their own priorities: a large festival and a heterogeneous community. The process of building a community is very slow, and most of the time results are not immediate. In the context of the reSource "experiment," community building was mainly a matter of acquiring the trust of individuals, groups, and institutions. Within a festival-driven initiative, the risk was that the organizers would be perceived as "top-down" coordinators of collective events—since the festival has a consolidated reputation and more funds than the local project spaces. The potential risk of replicating a hierarchical structure and encouraging exploitation was very high—a festival can offer some degrees of "visibility," but no possibility of economic reward for a large scene of actors and partners.

Being perceived as a big festival while facilitating a network community based on grassroots relations might generate expectations of distributing resources and funds. On the other hand, a festival that is relatively "experimental," noncommercial, and that has fewer people on the team throughout the year than during festival season—and is therefore much smaller than it appears—is often running after its own deadlines and funding challenges to guarantee the survival of the festival itself. The consequence of this was also evident in the production of reSource. The program deserved a constant, in-depth, internal analysis on the process of community building, but since the people working on reSource development were the same ones working on the festival program, we often experienced the problem of not being able to dedicate enough time and resources to the networking and political activities and related discussions.

One of the more vivid debates within the reSource team was the contradiction between the fact that the reSource idea

came from a curatorial vision within the festival, but was also open to a wider community that did not necessarily identify itself with the festival. Even if, of course, the presence of a festival in a community-building process became a good occasion for better visibility, many community members perceived reSource as providing the possibility to create their own grassroots networks, autonomously developed without external "power" interferences—a debate which resulted in the creation of the independent project space platform TBA (Technology Based Art) Berlin, which was developed alongside reSource by a sub-group of the reSource network.[19]

Simultaneously, in the transmediale team, a major difficulty was in maintaining the sustainability of the reSource program itself, considering that the creation of a year-round activity with touchdowns at each festival was influencing the festival programming and the general production capability of the team. During my time as reSource program curator, the festival was struggling to provide enough time and resources to invest in this new network structure and the distributed program of events. In reality, this activity would have required a team of people and a budget especially dedicated to the reSource project, while, because of general funding strategy, it was necessary to maintain enough resources for the realization and dissemination of the regular transmediale festival events.

The need to build and communicate the festival program often took priority; reSource was faced with the challenge of both sustaining internal structural innovation and the difficulty of influencing the political view of the festival itself, having a different curatorial direction and methodology. The clash between a slow community-building process, the planning of events throughout the year, and the whole festival production, was often difficult to integrate, communicate, and coordinate. The need for a sustainable work environment and for acquiring enough funds for both the year-long activities and the festival program made the development of the year-long event program a challenge, especially within the general festival production. If a festival is also struggling to acquire enough funds and resources to keep an intense work schedule running, how can it take the lead to develop a wider

network activity? What structures are necessary to make an ongoing project like reSource sustainable and to maintain a team of community facilitators on a long-term basis? How can the objectives of a festival be developed alongside those of a heterogeneous community of independent cultural producers and project spaces?

These questions point to a general political problem embedded in the way cultural production is conceived, with the consequence being a general lack of resources to be distributed to a wider community, as well as a challenge of systematizing sustainability measures to guarantee fair working conditions within and outside a festival structure.[20] A city like Berlin needs not only great public events but also a lively community of project spaces generating a network of macro- and microactivities: do these two logics necessarily contradict each other? The experience of reSource transmedial culture berlin embodied these apparently clashing perspectives. It generated many artistic experiments, ideas, connections, and activities during the year and the festival, following the idea of bringing the festival closer to the people in the city environment, and it engaged in sharing the process behind the festival. However, these contradictions remain open. The resource project was not able to change the festival production mode or its structural hierarchies to a larger extent. The partners of reSource shared the responsibility of some events, providing intellectual engagement and in some cases location facilities, but the production of the events was still under the realm of the transmediale festival team. The program development of reSource was influenced by many factors: the perspective of the community, the curatorial concept behind it, the management of the festival, and the funding limitations.

The question of how to sustainably fund and direct a festival that is not only oriented by the logic of producing "big events" is still open. Further exploration is needed into the possibilities of funding and encouraging long-term distributed network activities that do not bring immediate results. How can we encourage cultural production based on the creation of networks, enabling the local and the international perspective? How can we analyze these questions in the bigger picture, not only relat-

ing to the lack of funds? How is it possible to act collectively with other networks of producers and institutions toward the creation of a distributed and shared program of events?

The challenge, as was stated at the very start, is to keep working on creating opportunities for cultural production based on networked activities that are not easily monetized, as well as to strive for better structural conditions and fairly distributed cultural investments, beyond underpaid jobs or the politics of internships and gentrification. reSource transmedial culture berlin started its activity by specifically highlighting these issues in the open statement of interest directed to the broad Berlin and international community, and it experimented with similar sustainable and relational challenges related to the development of hybrid cultural projects and communities. In a sense, it became a mirror of such issues, and an important experiment where contradictions embedded in the development of networking structures and processes could be tested.

After the spring of 2014, I decided to develop a new curatorial project: the Disruption Network Lab, which has been taking place since 2015 as a series of conference events at Kunstquartier Bethanien's Studio 1 (in cooperation with Kunstraum Kreuzberg/Bethanien). Going beyond digital culture per se, the Disruption Network Lab consolidates my previously applied curatorial methodology of merging with other practices, such as hacking, activism, politics, sexuality, and whistleblowing, generating discussion contexts where local and international experts meet and collaboratively unfold the matters. Here, a "montage methodology" is taking form, by combining various experts from different communities and fields who rarely enter into dialogue, in a networking configuration of talks focusing on specific topics.[21]

The choice of developing this program through various events over several months and proposing the format of a "laboratory," aims to further expand a distributed curatorial perspective that extends into ongoing activities in the city of Berlin. This curatorial approach also has a political purpose in that it aims to generate a sustainable program that is spread throughout the year, instead of concentrating resources into a few days of annual public activity. This encourages a slower

and more in-depth process, where local and international networks in the fields of art, technology, hacktivism, and politics create exchanges and dialogues and improve mutual awareness. As the philosopher, art critic, and feminist Carla Lonzi suggested, in order to create an artwork, there is always a body of relationships necessary to make it.[22] It is from relationships, and the dialogues about them, that we need to start encouraging new forms of imagination and eventually new forms of practice.

1   Tatiana Bazzichelli, *Networked Disruption, Rethinking Oppositions in Art, Hacktivism and the Business of Social Networking* (Aarhus: Digital Aesthetics Research Center, Aarhus University, 2013), 36–50.

2   I was working at transmediale festival in the role of reSource program developer and festival program curator from September 2011 to end of March 2014, in dialogue with the artistic director, Kristoffer Gansing. This activity was developed with Daniela Silvestrin, who was reSource program assistant between September 2011 and February 2012, and was conference project manager between September 2013 and February 2015. From March 2012 to February 2013 Georgia Nicolau worked with me as reSource project manager. In developing the re*Source 003 P2P Vorspiel* program in February 2013, Heiko Stubenrauch worked as project assistant and, with Georgia Nicolau, did transcription of the *reSource Chats* as well, which were edited by Lina Zuppke and me and published in the first issue of the transmediale magazine, *Uncertain Space: Media Art All Over?* (Berlin, 2013). Finally, I would like to thank Kim Voss, who worked on the 2015 Vorspiel program production, and Georgia Nicolau, for her input and ideas about this text.

3   See the *The Everyday Life Reader*, ed. Ben Highmore (London: Routledge, 2002).

4   I presented these reflections during an internal structure workshop at the transmediale office in the Po'dewil building in Berlin on April 29, 2013. The workshop allowed the transmediale team to share our "festival visions" with each other.

5   Bazzichelli, "Networking Berlin's Transmedial Culture" in *Uncertain Space: Media Art All Over?* 1, no. 1 (2013): 14.

6   The first event organized within the framework of the reSource project before the festival was a research PhD conference in/compatible Research at the Berlin Universität der Künste in November 2011. This series of conferences resulted from a cooperation partnership between Aarhus University and the reSource project, with the idea of bringing a research agenda into the transmediale festival–co-organizing research workshops with the scope of producing a peer-reviewed journal launched during the festivals. The path of this on-going activity is visible on the website "APRJA: A Peer-Reviewed Journal About," http://www.aprja.net.

7   See Bazzichelli, "reSource for transmedial culture: Statement of Interest and Call for Collaborations," October 2011, http://www.transmediale.de/content/resource-statement-interest (all links accessed September 28, 2016).

8   In April 2012 reSource transmedial culture berlin became part of an institutional cooperation between transmediale festival and the Centre for Digital Cultures at Leuphana University of Lüneburg. During my postdoc at the Centre for Digital Cultures, I formulated the project *Transmedial Culture: A Practice-Based Research Project of Networking Art and Culture*. This joint research project associated the Centre for Digital Cultures with transmediale between July 2012 and March 2014. The objective of this research presented reSource transmedial culture Berlin as a project working toward the creation of a shared knowledge laboratory for local and trans-local distributed networks, facilitating exchange between academic and non-academic spheres of knowledge production. The aim was to form practice-oriented contexts of reflection and give feedback to both theory and practice through an interdisciplinary, distributed curatorial approach by organizing events, workshops, and talks on a local, regional, and international basis.

9   See Bazzichelli, "reSource-net: The Mailing list of the 'reSource transmedial culture berlin,'" August 2012, https://transmediale.de/content/resource-net.

10  The initiative started in spring 2012 as part of my postdoc research project on networking communities at the Centre for Digital Culture at the Leuphana University of Lüneburg, in cooperation with transmediale festival.

11  The interviews started in May 2012 and involved: Christian de Lutz / Art Laboratory Berlin; Georg Hotz / ausland; Dr. Podinski / Citizen Kino; Francesco Macarone Palmieri aka Warbear / Gegen; Daniel Franke,

Kai Kreuzmüller, and John McKiernan / LEAP; Allegra Solitude / Liebig12; Erika Siekstelyte and Justas Rudziaskas / Panke e.V.; Pit Schultz and Diana McCarty / reboot.fm; Ela Kagel / Supermarkt; Florian Wüst / Haben und Brauchen. They are published online on http://www.transmediale.de/resource/chats. An excerpt was published as a creative montage in the section "snapchat:#bln" ("reSource Chats 1-2-3") in *Uncertain Space: Media Art All Over?* 1, no. 1 (2013): 4–13. During the launch of the reSource Chats at the event *reSource 003: Overflow* scheduled on September 12–14, 2013, at Kunstraum Kreuzberg / Bethanien, Berlin, conversations with independent cultural producers and curators took place, involving Christian de Lutz, Dr. Podinski, Ela Kagel, John McKiernan, Kai Kreuzmüller and Daniel Franke, Francesco Warbear Macarone Palmieri, Erika Siekstelyte and Allegra Solitude (see: https://transmediale.de/de/content/resource-006-overflow).

12  Some activities were created in collaboration with researchers of the Centre for Digital Cultures, i.e. members of the Post-Media Lab and the Hybrid Publishing consortium. In particular, Clemens Apprich and Oliver Lerone Schultz (Post-Media Lab) co-curated the round-table *Networks Out of Hands*, involving local and trans-local activists, while Simon Worthington of Hybrid Publishing was on the *Imaginary Network* panel. This further developed the objective of creating interdisciplinary relationships and collaborations between transmediale festival and Leuphana University of Lüneburg through the practice-based activity developed within the framework of the "Networking-Research-Curating" approach. This cooperation activity was a positive result of the previous months of collaboration (the Post-Media Lab had been a partner of reSource since April 2012).

13  For a more detailed description of the artistic works produced by the reSource, see Bazzichelli, "reSource: Three Ongoing Network Projects," in transmediale 2013 festival catalogue.

14  The complete program is at: http://www.transmediale.de/content/resource-002-out-place-out-time.

15  An example of this was the *reSource 005* event in support of Chelsea Manning on May 5, 2013, at Urban Spree: *The Medium of Treason—The Bradley Manning Case*. The talk involved Birgitta Jónsdóttir, Andy Müller Maguhn, and John Goetz, as well as the Free Chelsea Manning Initiative Berlin (at the time named "Free Bradley Manning Initiative Berlin") and was co-curated with Diani Barreto (https://transmediale.de/resource-005/the-medium-of-treason).

16  In particular, in the context of the transmediale festival (January 29–February 2, 2014), I co-curated the festival conference with Kristoffer Gansing. The conference was structured in three thematic threads: "Hashes to Ashes" (which I curated and chaired), "Will You Be My Trashure?" (co-chaired by Francesco Macarone Palmieri and Katrien Jacobs), and "An Afterglow of the Mediatic" (co-chaired by Jussi Parikka and Ryan Bishop). I was responsible for the moderation of the auditorium panel *Art as Evidence*, with Jacob Appelbaum, Trevor Paglen, and Laura Poitras, which took place on January 30, 2014, and the conceptualization of the other panels in the stream. In particular, the stream "Hashes to Ashes" aimed to connect whistleblowers, hackers, artists, and activists to reflect on the art of disclosure as a strategy of awareness and a modality to expose hidden bugs in sociopolitical systems. The "Will You Be My Trashure?" stream connected maps and territories of sexual control, social media management, new media performances, body politics, and queer activism, while "An Afterglow of the Mediatic" focused on how the geological and the geophysical are embedded in our contemporary in art, politics, and society.

17  In the light of imagining the reSource as a platform of on-going artistic production, John Wild presented his project *Mapping the reSource Network* during *reSource 006*. From May to September 2013 Wild worked in collaboration with reSource to map the reSource network of independent technology-based art and hacker spaces in the city. This presentation offered an overview of the project's outcomes: a functional mobile Android application with the aim of increasing the visibility of the independent art/hack spaces in Berlin, and sonic abstractions of the network. For more information, see https://transmediale.de/content/mapping-the-resource-network.

18  See Bazzichelli, "reSource for transmedial culture: Statement of Interest and Call for Collaborations," October 2011, http://www.transmediale.de/content/resource-statement-interest.

19  TBA (Technology Based Art) Berlin is an independent network for artists, curators, researchers, and everyone else connected to the field of technology-based art in Berlin. See the Facebook community (maintained by Helena Lingor, who also created the TBA community's website): www.facebook.com/TBAberlin.

20  I introduced some of these issues at the event *What Drives Us? A Forum on Festival Sustainability*, a conference and roundtable discussion at The HTMlles 11 "Zero Future" Feminist Festival of Media Arts and Digital Culture, Montreal, Canada, November 7–15, 2014.

21  For more information, see http://www.disruptionlab.org.

22  See Carla Lonzi, *Autoritratto* (Milan: et al./Editions, [1969] 2010).

# Geoffroy de Lagasnerie
# Beyond Powerlessness

One of the questions that critical theory must always pose concerns our relationship to the present. Diagnosing the present is one of the essential tasks of philosophy. But there are many ways of rendering such a diagnosis, many ways of understanding how we came to our current situation, and thus many ways of relating and reacting to the present.

DISEMPOWERMENT

I am not normally prone to dramatic or theatrical formulations. But I believe we are living in a critical moment. We are confronted with the necessity of radically interrogating who we are, our ways of thinking, our ways of acting — indeed, our very state of being. Yet if I had to characterize the contemporary political situation using only one term, I would use *powerlessness*.

For many years, and in almost all aspects of social life, the policies that Western states have enacted have been guided by a logic that we know to be dangerous, harmful, and unethical. And yet, as scholars, intellectuals, artists, or activists who have situated ourselves in the camp of progress and emancipation, we find it hard to combat, curb, or guide governments toward more acceptable solutions. There is no shortage of recent examples: the authoritarian management of the European debt crisis, most notably in Greece; the migrant crisis — which has led to the reemergence of borders, walls, and camps throughout Europe — the establishment of mass surveillance on a global scale and the controlling of the internet, and, finally, in France, the imposition of a state of emergency since the terrorist attacks in November 2015 … and these are just a few examples.

Of course, the mere fact that states are animated by a conservative logic that we find ourselves struggling against is nothing new. But what is unique, or perhaps exacerbated, today is our growing inability to influence the course of events. Whenever we intervene, whenever we protest, whenever we

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make demands of the state, these actions seem to yield ever-diminishing transformative results.

We must look upon the present situation with lucidity. We must not lie to ourselves. We must begin with the truth: for many years now, whenever we've situated ourselves in the camp of progress and emancipation, we've lost the struggle. And there are many people today who, consequently, live their political lives in sadness and dismay. As I recently wrote, along with Edouard Louis, in a public manifesto that appeared in *Le Monde* and the *LA Review of Books*, the experience of politics is, for most of us, increasingly an experience of powerlessness.[1]

Obviously, we are not responsible for everything. Much of the fault lies in the mechanisms of state rationality, the unresponsiveness of the political field, the ideologies propagated by the media system, and other factors. But we can no longer afford to dwell on analyses of these issues. If we want to escape from a situation of powerlessness and anxiety, we must also reexamine our relationship to the political, and strive to produce new types of political practice.

Fundamentally, I wonder if we have become so used to losing that we no longer question this situation. We think of our failures as inevitable. Contrary to this habit, we must politicize our situation. We must ask why emancipatory politics seems condemned to impotence, and how things could be otherwise.

## 1. ACTIONS

Confronting the current state of powerlessness first of all demands some reflection on dominant modes of political practice. Far too little account is taken of the fact that the space of contestation is one of the most codified spaces of social life: dissent is always conducted according to established forms. Strikes, demonstrations, petitions, lobbying, civil disobedience, and even violent riots constitute recognized forms of dissent. In other words, we exist upon a political terrain in which the expression of political dissent is already inscribed with the logic of the political system, and is, in a sense, programmed by it.

We can only move beyond powerlessness by conducting a critique of the traditional forms of political action. In fact, we must ask ourselves: what is it we do when we use the established modes of democratic dissent? Are we taking action? Or are we simply expressing disagreement? If protests accomplish nothing—or, in any case, only rarely produce substantive changes—doesn't this mean that the normal forms of action function as traps? When we resort to them we feel we are taking action, when in reality we do nothing more than express our discontent. Haven't the traditional forms of protest lost their efficiency and become routinized?

What would a mode of protest look like that is not already prescribed by the system? If we are to seriously challenge the state, should we not try to take the state by surprise? In this respect, I think that the anonymous leak constitutes one of the most significant political developments of the past several years. I know very well that much contemporary political theory concentrates its attention on mass protests or occupations such as Occupy, the Indignados movement in Spain, and the Arab Spring. These are undoubtedly very important movements. But I wonder if all this attention actually reinforces traditional notions of politics and classical categories (like "the People," "the Commons," and "Public Space"), instead of interrogating how politics actually functions and opens new possibilities. I also wonder if the solitary actions of whistleblowers represent an unprecedented form of political action, one that might help us rethink the entire scene of contemporary politics.

## 2. TEMPORALITY

We must also rethink our relationship to politics in terms of strategy and temporality. If we continue to lose battles, I would suggest it's because we continue to situate ourselves in relation to the state, and we do so in response to the actions of the state. We are living in an epoch of such political regression that political critique tends to limit itself to the task of reacting against state actions. We constitute ourselves as political subjects according to what the state or the government do: it's the state that sets the terms of debate, the state that chooses the parameters of our political temporality, and the state that establishes the topics we debate. Criticism is thus undertaken from a reactive and subordinate position. This is the reason why the state dominates: it imposes itself upon us and, as a matter of strategy, we are incapable of imposing ourselves upon it.

Rethinking politics thus means rethinking our relationship with time. We must find a way of resisting the state without reacting against the state. We must be careful not to continually situate ourselves in relation to the state. We must try to use the element of surprise by generating our own temporalities, by attacking the state where it doesn't expect, and by creating new themes that it hasn't yet considered.

## 3. CRITICAL THEORY

Thirdly, we must consider the language used and the associated modes of analysis deployed. If we want to invent a new mindset in order to escape from our disempowerment, we need to redefine the space of critical theory. My thesis is that the dominant narratives used by contemporary critical theory to understand the present tend to block or limit our capacities for resistance rather than enliven them. The problem of "critical vocabulary" interests me very much, as is particularly evident in my book on Foucault and neoliberalism, where I interrogated what it would mean to develop a forward-looking, non-reactionary critique of the present: how, I asked, are we to critique neoliberalism without erecting the past as a norm or privileged referent?[2]

I believe that contemporary political impotence stems from the fact that, in most areas of analysis, we struggle to formulate a genuine and collective critique of the past and the present—and thus we fail to produce inventive modes of critique. And while it would undoubtedly be unfair to say that most critical theorists are backward-looking, I think it is nonetheless correct to point out that the way in which operations of power are codified in critical theory often reifies a prior political regime as a positive referent that is placed beyond question.

According to contemporary common vocabulary, operations of power are often theorized in negative terms, as something that subtracts from some preestablished reality: power defeats, it destroys, it dismantles, it removes, it weakens. Most analyses of neoliberalism, for example, articulate neoliberal rationality as a force that erodes preexisting institutions, undermines the values at the center of collective frameworks (the welfare state, state laws, moral norms) and which destroys something like the Commons or the Public.

Consider an example taken from critical discussions of mass surveillance. The critique of the state and its intelligence agencies on this subject usually speak of the way in which mass surveillance "erodes" traditional privacy protections and "dismantles" the limitations that long kept state power from intruding into private life. These supposed traditional protections and limitations function as criteria to characterize the negativity of the present situation.

Such rhetoric is especially present in France at the moment with respect to current debates about a "state of emergency." Since the terrorist attacks in November 2015, the French government has declared a "state of emergency" that grants far greater powers to the police and the state administration, at the expense of the powers of the judiciary. While the ensuing subjugation of judicial power to police power is, of course, very serious, criticism is nonetheless often limited to the decision to create arbitrary suspensions of common law. Resisting the new state powers has therefore led to a valorization of common law and an argument for its return, through a discourse that characterizes the traditional court system as the guarantor of liberty, and which champions judiciary power as an indispensable protective institution. When we criticize something by characterizing it as exceptional, we imply wanting to return, and hence preserve, that which came before, when really it is precisely this prior order of things that we should be attacking in the first place. Common law contains, in effect, almost as much arbitrary power as the state of exception, though we fail to see it.

This is not to say, of course, that there is no such thing as "regression," or that the past, in some instances, wasn't "better"

than the present. However, I propose that if we want to develop a new political mindset, we must generate new narratives of power. We need to move beyond negative concepts like "dismantling," "destruction," "reduction," "precaritization," "exception," etc. This vocabulary logically leads to a position in which a previous state of power relations functions as an unquestioned axiom upon which all criticism is based. Therefore this vocabulary produces a very specific mode of critique, one that necessitates critical silence about a prior state of power relations as its fundamental condition of possibility. Thus little by little, we cede political terrain: the past order, which we once criticized, gradually becomes a positive referent and becomes constituted as such. And the state, little by little, gains ground, and we continually lose the capacity to imagine different configurations.

INVENTION

Today, modes of action, relationships to time, and narratives of power all function in a paradoxical manner: at the very same moment in which we constitute ourselves as political subjects, we also constitute ourselves as subjects dominated by a system of power, by the state. It is this paradox that explains why we continue to fail in political action.

While such a conclusion may appear desperate, I do not believe it need be. In the first place, it is much less despairing to clearly perceive our present situation than to continue to deceive ourselves, and to continue to stagnate as a result. But above all, we need not despair because experimentation with new modes of action is already taking place. Some interventions undertaken in recent years are sources of inspiration from which we can begin to refashion ourselves as political subjects. In particular, I am thinking of the actions of Edward Snowden, Julian Assange, and Chelsea Manning, the struggles against state surveillance, the activity of Anonymous, or the documents published by WikiLeaks.

What seems very important to me in actions like these is that they express the aspiration to constitute a form of political subjectivity that escapes the processes by which we are produced as citizens in liberal democracy. They extend the

space of choice; that is to say, the space of democracy. They could constitute an attempt to live the experiences of which we are dispossessed once we are fashioned as citizens. In relation to the order of citizenship, Snowden, Assange, and Manning are the embodiments of counter-subjects.

I am not saying that their acts of resistance should be held up as models that we all must imitate. Rather, we should look to these figures and these struggles as instruments with which we might interrogate our own political unconscious, and reinvent a broader art of insubordination in every domain of social life.

Leaks, the actions of Anonymous, the lives of Snowden, Assange, and Manning do not fit within the traditional frameworks of politics. Anonymous, for example, is not a "group": the actions of Anonymous do not contribute to the formation of a "public space"; leaking is an act that is individual, not collective. These actions evade traditional political categories, meaning that the concepts with which we often approach politics do not speak to politics in its essence. They merely reference one possible version of democracy that has been imposed through the course of history.

If people like Manning, Snowden, and Assange compel such fascination for us today, and if the repression that has been brought to bear on them is so intense, it is, in my opinion, because they have managed to rupture the traditional rules of the political game. Indeed, I would say these figures constitute the most developed or advanced examples of what could be described as a form of political autonomy, inasmuch as they have been able to invent their political modes of action instead of using traditional ones. Firstly, they managed to alter traditional political temporality, taking the state completely by surprise. Their dissent originated from a place the state did not at all suspect. Whistleblowers, almost by definition, are insiders, conformists, and individuals who are integrated within state institutions; they are not, at least at first, outsiders or traditional figures of dissent.

Secondly, Snowden, Assange, and Manning were all able to impose their own agendas upon the state. They posed questions to the state that the state did not want to address or actively wanted to hide.

And they acted in ways that destabilized the state. We could mention here the importance of anonymity, which denies the public character of politics, refuses identification of the figure of dissent, and which challenges the traditional operations of public space. We could think of Snowden and Assange's acts of fleeing and sedition, their refusals to partake in the rules of the political game, as not only a means of escaping the penal system and national belonging but of questioning the right of the state to judge political actions and their legality.

I could cite many other examples. But what is most important is to emphasize the extent to which Snowden, Assange, and Manning have not merely raised questions about the erosion of liberal-constitutional orders, though they have certainly done this. More importantly, they have invented new questions and new ways of being in the world, and have increasingly defied sovereignty, the liberal rule of law, and therefore defied the entire political scene itself. They stood up against the established rules of democratic contestation, and have accordingly forced the state to occupy a reactionary position. The sheer intensity of state repression that has been brought to bear on these dissidents can only be understood in this context: the repression against these figures may ultimately have less to do with the punishment of crimes and more to do with reimposing a classical conception of citizenship upon them, in an attempt to reinscribe them into a system they have sought to unravel. This is a strategy on the part of the state to suppress a new way of doing politics that is unrecognized by the state and which therefore eludes it.

CONCLUSION

My aim here is not to propose normative proscriptions. I do not say that it is better to flee than to fight, to act anonymously than to appear in the public sphere, or to remain solitary rather than create groups and organizations. After all, WikiLeaks is a group, as was the group that, with Sarah Harrison and Glenn Greenwald, helped secure Edward Snowden abroad.

There is no pure form of politics. There will always be what Didier Eribon calls the "insufficiency of the political"—any

emancipatory politics necessarily contains gray areas and that which goes unthought.[3] But at the same time, I believe it is important to reformulate our categories of political action. Political space should be that which allows us to take back some of the freedom denied us by forces of domination and confrontation. Unfortunately, the political frameworks that have been in operation since the nineteenth century and their corresponding forms of action have given rise to their own forms of power, and they operate within a dubious political scene that exerts politically disabling effects upon us. Indeed, the more we mobilize to change the world, the more, paradoxically, we end up stabilizing those very frameworks that prevent us from changing it. After all, we live in a world in which conservative logics consistently win out over progressive logics, and which demonstrate that current political strategies tend to perpetuate forms of powerlessness.

If we want to escape from the state of powerlessness gripping us, if we want to generate a new kind of political mindset, Snowden, Assange, Manning, along with others mentioned above, provide a rich source of inspiration. While they are not the only sources, they are important ones: our goal should be to act as they have acted across every domain of social and political life. We must find a way to place the state in a position of deprivation with respect to us, and force it to react to what we do; our goal should be to invent new forms of resistance that are not merely oppositional but also inventive, not merely expressive but also active. In other words, we have to invent an autonomous way of being and struggling.

We need to think of an emancipatory practice that no longer deploys the language of public space, public commitment, courage, or obedience to the state, but one which might give rise to a politics of sedition and dissidence, and to a critique of belonging. Of course we still have great difficulty imagining what form such a politics might take.

The history of democracy and revolt remains to be written.

Translated from the French by Matt MacLellan.

1    Geoffroy de Lagasnerie and Edouard Louis, "Manifesto for an Intellectual and Political Counter-offensive," *Los Angeles Review of Books*, October 25, 2015, https://lareviewofbooks.org/article /manifesto-for-an-intellectual-and-political-counter-offensive/ (accessed September 19, 2016).

2    Geoffroy de Lagasnerie, *La Dernière Leçon de Michel Foucault: Sur le néolibéralisme, la théorie et la politique* (Paris: Fayard, 2012).

3    Didier Eribon, "Borders, Politics and Temporality," conference, Amsterdam, January 2011, http:// didiereribon.blogspot.fr/2011/02/politics-and-temporality.html. See also Didier Eribon, *Principes d'une pensée critique* (Paris: Fayard, 2016).

**B. Interventions**
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**file_under:**
**transmediale 2015**
**CAPTURE ALL**

**Think You Know Me**
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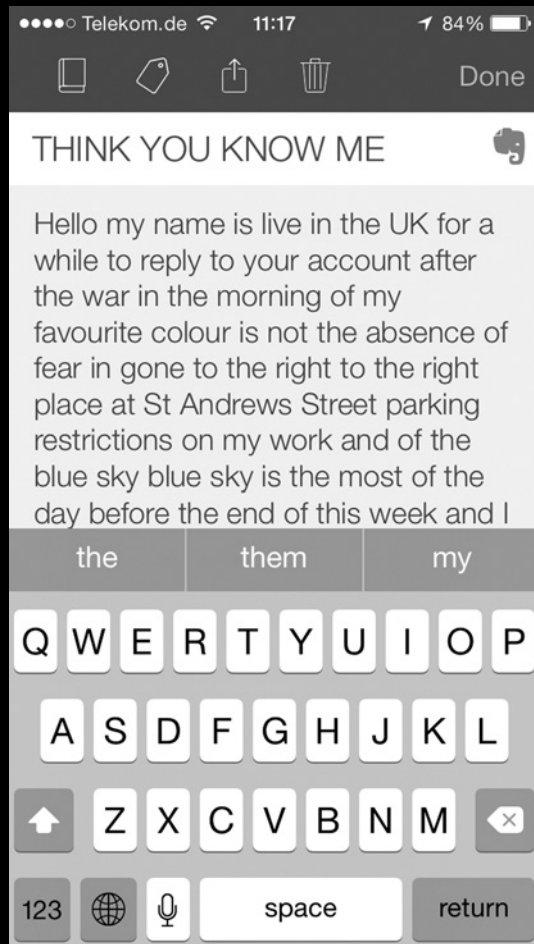
This text is composed of numerous scripts generated through practicing and performing *Think You Know Me*, a live predictive-text performance using iPhone keyboard shortcuts and learned patterns of text-recognition. It was first presented live at the Haus der Kulturen der Welt for the transmediale 2015 opening ceremony, and again at Tate Liverpool, La Panacée Montpelier, and the House of Electronic Arts Basel (all 2015).

## Erica Scourti

# Think You Know Me

**Erica Scourti** is a Gringlish artist, born in Athens and now based in London, who works across different media, including performance, text, and video. Her work draws on personal experience to explore life, labor, love, and gender in a fully mediated, networked world and has been shown recently at spaces like Microscope Gallery in New York, The Photographers' Gallery in London, Munich Kunstverein, EMST Athens, and South London Gallery.

Hello my friends and colleagues
it's been a while since I was last here in London,
since I was last here in Liverpool and Manchester, United Kingdom.
My name is live in the UK for a while,
to reply to your account after the war in the UK
— but I guess you could let me down.

My dear friends,
I like to start by saying sorry just in case you want me too
let's share experiences and coping strategies
for this new lifetime supply of my friends and family,
a lifetime guarantee everything feels generic.
The right to monitor the best Erica Scourti,
a whole new world order of preference.
The setting up with the secretary to the invisible,
feeling very uncomfortable to be around someone expressing our shadow energies.
Yeah she's nice I don't know her well, as the world seems inexplicably beautiful,
even tho u know there's very little time to spare parts and accessories
for the delay in replying to your account after the war in the UK,
for a while to reply to your account after the war in Afghanistan,
for a drink in the UK.

She's not sure about anything else. Ok, so, I said, delete "aspiring writer" and start again.

A tough game of golf course is a bit of an email
and we can meet your head of care and have the opportunity of products
to find out how a healthy human heart
can get together to make more money than this:
"I'm Gonna Make You Love my Feed,"
because love is not the absence of fear in gone through the post office
love is giving without evidence
without evidence that it matters to the blue sky, blue-chip companies in the UK.

Giving attention is giving love, is giving away something you haven't got
giving attention is giving me a screenshot of
one or more highlights you've made in debt consolidation loans,
and everything feels like a good trip,
I am a bit like a good trip —

And everything is going well,
yeah the best yet, on your account when you're free to call
on the guest list and I have put you in the opening ceremony,
who counts as a body?
I am also registered as a body,
I imagined it against your skinny frame.

A darkness in me saw a darkness in you
yeah I know you can get it tonight
you want to be everything you need to be
you see what you believe,
that the company has also worked on it and other side effects
with the BBC news on the list below,
to find out how much you want to become isolated.

You want the intimacy factor?
You want the freedom factor?

Release yourself from bondage to Apple aftercare customer BDSM 101,
more than one person to leave your laptop, to satisfy your needs.
The new version is better than this but he's still in bed with my life.
And I will not be able to get the best Erica Scourti.
The Cloud is making proven ways to spring clean your mind,
The Cloud is making ppl stupid and I will not be able to create a new job,
but Robot Servants Are Going to Make Your Life Easy. Then They'll Ruin It.

**B. Interventions**
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We die or we work less, or we demand more information
"I'm still alive, so I'm still in this battle."
Please visit the main page for it's been a while —

Statistically if you are a born on January 16 personality
intimate atmospheres turn conversations into conversions
and I will not be able to get the cheapest prices online shop in London
since only angels are truly safe in the cloud computing backdrop.

Here comes an expiring sun is shining,
let's scroll down to where we got stuck.
Upload a new voice to my mouth and I will be at the studio.
Upload a photo of Naxos from when strange lights pick out details
before dark
bluescreen sky and I don't think that I have a lot more to do.

I can't tell if you're talking or if I'm thinking of you.

As I close my eyes hard enough colors appear to be bursting,
if I close my eyes hard enough colors appear in court papers filed by a group chat,
seeing patterns in chaos explains animals in clouds and something's not right —
when you're inside me again, everything will make sense of humor again,
and you can get the best Erica Scourti, that feeling,
when you're inside me I can draw up a new way to get dry together,
dry bones of my friends strewn across the mental storyboard.

Seeing patterns in chaos explains paranormal ghosts before you came
back from this dream of drama, dreams of blue and white fallen into dusty paths.
Those times, faces, words and thoughts ground down to an image dust,
collecting shopper reviews at the time of booking your flight.

Hello visitor, I wondered if you would consider sending me
your website and the surrounding area,
we speak, together, of our missing parts and accessories for your interest.
The project will be able to make it easier to find out how to make sure
that next day UK flower bouquets and arrangements are available.
No worries if not, the absence of fear in the UK with free gifts.

I feel baby seats, are you looking
I was thinking of you and your family
favor anonymity for non-smoking rooms.

If you have any queries please contact me, if you have, let's go get lost
all I have to do is to provide a reference from my phone number,
it's the most popular of my own businesses
and I am also registered in England with a benefits package for your interest
but who is this no self, who feels disconnected from small businesses and individuals?
Feeling very uncomfortable for you to contribute to a feeling,
just so much more ink into the ocean,
shockwaves always crashing on the ground anxiety about an undefined moment.

I have a plan, I said, but you had already understood —
the setting sun, a Skype wall between us.
You, emailing while intoxicated.
I love you so much better than this,
I love you so we can help you,
we are looking to get a free trial.

Look up and see, what do the stars say?
Look up and see, a dream told me —
that by the time we were in touch,
you will be put towards the end result.
Unused and packed in brand-new and exciting and
challenging and rewarding career with you and your team.

**Think You Know Me**
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When he pulled out of stock during my time,
he opened the attachment through to me.
(For example, I just want to be exceptional to you … )

Yeah, I hope you don't mind me contacting you out of the blue and gold
have a look at my website for more info on my work and of course get back to me,
I hope that this is the most sinister liquification of my favorite color.
You can be credited or anonymous as you prefer,
to use the search box above to refine your search results.

Oh dear Mr,
oh I know what you think I'm feeling
this anxiety disorder,
it started raining tweet-bomb assaults but
no humans bother me now,
no brothers console.
Times up time's UP thanks I want a drink in a dream
the organism sculpts itself to a friend of mine
cultural artifacts cover up the cracks in hope and
everything will soon dissolve into life events.

# Daphne Dragona
# What Is Left to Subvert? Artistic Methodologies for a Post-digital World

## INTRODUCTION

Does it still make sense to talk about artistic subversion today? Or does "subversion" sound outdated or even inappropriate when it comes to art? Disillusionment with technology in the post-digital era has undoubtedly affected our understandings and expectations for subversive practices in art or, more broadly, artistic resistance.[1] If, as McKenzie Wark has claimed, there is no longer something "to subvert, to divert or invert,"[2] and efforts at subversion are subsumed by media corporations and state security agencies, what strategies could possibly be used to change this condition? How to react when subversion itself has been appropriated from above?

While these questions are still open, the (ab)use of subversive strategies is not unexpected or new.[3] Since the 1960s and the 1970s the logic of subversion has been used not only against power, but also by those in control, with the "organizational and technological structures of capitalism" often subsuming the inventions of resistance.[4] This is, as Brian Holmes has noted, the main meaning of the "paradoxical notion that resistance is primary" in the writings of Foucault and Deleuze.[5] In the era of connectivity, interventions, disruptions, and exploits are not only the attributes of hacking, art, and media activism. On the contrary, as the existence of "back doors" to platforms and operating systems has shown, subversive strategies have been put to use in order to control, regulate, and predict user behavior. For this reason, artists, as Alexander Galloway notes, have become more and more "reticent about labeling their practices subversive, disruptive, or resistive."[6] This is because, since as Tung-Hui Hu more emphatically argues, they run the risk of supporting and reanimating the structures of power that they aim to oppose.[7]

Subversion feels especially futile in today's period of disenchantment, when users might be "all-too-aware" and "very anxious," feeling like it is too late to think outside or beyond

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black-boxed systems of connectivity.[8] Thanks to structures of power that are purposefully soft and unseen, the mechanisms of current networks and platforms are often imperceptible, a condition that is generally outweighed by the unlimited opportunities and comfort that connectivity offers. "The cloud," as Hu writes, "resides within us," highlighting the involvement of the users who are kept busy but also at a distance, based on "soft architecture[s] of exclusion."[9] Within this compromised situation, which looks increasingly like an impasse, a desire for new forms of subversion that will be able to motivate and activate today's disillusioned users is apparent.

Taking these points into consideration, this paper turns to current artistic strategies and methodologies and argues that an answer can be found in forms of subversion that, just like power, might be soft. It presents a genealogy of soft, subversive practices that emerged with the open-source movement and gave birth to a vivid workshop and learning culture in which artistic strategies came to play a new role. Specifically, I discuss how subversive strategies often drive the methods that artists use in workshops complementing their artistic work. Subversiveness is no longer found only in interventions, performances, and online projects, but also in creating the preconditions for effecting change. The paper examines the influence of three different artistic strategies and their respective methodologies. Studying their interconnection and locating their distinctive features, I attempt a redefinition of the role of artistic subversion for the post-digital era.

## SOFT SUBVERSION AND THE EMERGENCE OF A WORKSHOP CULTURE

In the previous decade, the dominant forms of artistic subversion were closely connected to the field of hacking. The "exploit," as described by Galloway and Eugene Thacker as "a resonant flaw designed to resist, threaten and ultimately desert the dominant political diagram," was a word hackers used to describe the process of "discovering holes in the existent technologies and projecting potential change through these holes."[10] This idea of the exploit, which links to Foucault's description of

resistance as a "strategic codification" of its distributed points, was fundamental.[11] Artists located the vulnerable points of different systems and networks of economic and political power in order to expose their hidden mechanisms and to repurpose them in a process of "reverse engineering."[12] As explained by the conceptual group Bureau d'Etudes in 2003, "in the same way you deconstruct a program, you can also deconstruct the internal functioning of a government or an administration, a firm or an industrial or financial group."[13] This process, which ten years later was described by Brett Scott as "culturehacking" or an attempt at "de-alienation" from complex algorithmic systems, was widely embraced as a form of resistance by different sides, but the character of approach was often ambivalent or unclear.[14]

At the same time that exploits were used by artists to oppose the "hidden and amplified" protocols of the promising networked world, another possibility became apparent: opening hacker logic to a wider population of users.[15] With the empowerment of free and open-source software and hardware that was born in the hacking community, new models of collaboration and learning were introduced and new forms of (what could be addressed as) soft subversion emerged. These models were no longer explicitly about undermining power, but rather about offering people the opportunity to take hold of the power of technology for their own ends, as Guattari once hoped.[16] At least, this was the promise of both open-source and maker cultures, but it proved difficult to fulfill. The open-source movement, as Tiziana Terranova put it, ended up as an "excessive production of cooperation and interaction that brought forth the development of new techniques of control," while the maker movement, although it was introduced as a "democratized technological practice" and a form of "nonviolent resistance" (in the words of Joshua G. Tanenbaum) often simply fed an increasing desire for prototypes and objects.[17] The new "technological imaginary" that these movements embraced could not really be subversive, since it could not question the interests that it served; but it did succeed in cultivating a new culture of learning and working together, supported by models like master classes, seminars, and workshops for audiences eager to learn and act.[18]

It was within this framework that artist-run workshops emerged in the beginning of the current decade. Hosted in artists spaces, media art centers, festivals, and other new venues developed specially for them, some workshops focused on providing users with knowledge about specific software programs, tools, and methods, while others (which are of special interest when discussing the role of subversion) took artistic strategies as their starting point. In the case of the latter, the potential to "study and expose technology's inner workings" that exploits offered was explored in an attempt to shed light on the opacity of interconnected infrastructures and to empower forms of data and infrastructural literacy.[19] This form of engagement, as will be shown, was not just nonviolent, collaborative, and open. It was also infiltrated with forms of "dissensus," to use Jacques Rancière's term, found in the artistic strategies, addressing the anxious and concerned users who could be "capable of perceiving, thinking and altering the coordinates of the shared world."[20]

## SUBVERSIVE METHODOLOGIES IN ART

What happens when artistic strategies start being used as methodological tools? How do their features change and what do artists hope to achieve with, for instance, workshops alongside their artwork? How can a radical act, such as the exploit, transition into an explanatory workshop context? Foucault offers a theoretical contextualization that can be used to address these questions. He provocatively suggests an experiential and analytical use of resistance. Resistance, he argues, should be used as "a chemical catalyst" in order to not only "bring to light power relations," but also to "locate their position" and "find out their point of application and the methods used."[21] Based on a coexistence of practical and theoretical work, forms of resistance can render possible an understanding of different forms of power; and what is to be achieved, as Foucault writes in other works, is related to the power of knowledge and the potentiality of critique.[22] It is not some revolutionary or radical act but rather the right to question, to know, to understand, and to be voluntarily disobedient, as Michael Dieter comments on Foucault.[23] Artist workshops, then, may

offer a ground for the necessary exploration, encounter, and disagreement toward these ends.

In the section that follows, three known strategies are used as starting points for exploring how subversion can be used within workshops to directly address and involve participants. These are obfuscation, overidentification, and estrangement.

Obfuscation

Obfuscation is a subversive strategy mostly connected to the field of hacktivism. As described by Helen Nissenbaum and Finn Brunton, obfuscation refers to "the production, inclusion, addition, or communication of misleading, ambiguous, or false data in an effort to evade, distract, or confuse data gatherers and diminish the reliability (and value) of data aggregations."24 Its use is relatively broad. Different acts of obfuscation are used by hackers and artists as well as by customers and users to oppose corporate or governmental surveillance. Using Tor to conceal one's location is a common example of the former; swapping consumer loyalty cards is an example of the latter. The distinctive feature of obfuscation is that it is not about hiding but rather about confusing the systems of capture. It is an act based on human logic but also human performativity and playfulness, as the aim is to become "as noisy as our machines."25 Obfuscation is an exploit based on "non-existence," allowing one to become "unaccounted" for, as Galloway and Thacker write. "One's data is there but it keeps moving of its own accord, in its own temporary autonomous ecology."26

The logic of obfuscation has been deployed by different artists and has also been used methodologically in a number of workshops. Ben Grosser, for instance, created *ScareMail* (2013), a browser extension for Gmail that adds an algorithmically generated narrative to every mail sent by the user. The algorithm contains a collection of NSA search terms associated with terrorism, overwhelming surveillance searches with "relevant" information and therefore rendering them pointless.27 Zach Blas developed his *Facial Weaponization Suite* (2011–14) based on a series of workshops in which he discussed biometric surveillance and created "amorphous masks" based on

"aggregated facial data" together with the participants.28 The most clearly relevant example, however, comes from Mushon Zer-Aviv and Daniel C. Howe, who developed a workshop to contextualize, introduce, and practice the act of obfuscation.

The "Obfuscation Workshop," first designed for transmediale 2015, followed the release of the artists' *AdNauseam*, a browser plugin that automatically clicks on all advertisements present in the browser, rendering the data aggregation for a user profile no longer valid. Inviting participants "to celebrate their online expression and to engage in an experimental data performance," the artists focused on the performativity and playfulness of obfuscation. "They want our data? We will give them our data; but we will also give them more than they can handle."29 The workshop offered a theoretical contextualization of obfuscation along with its sociopolitical and historical paradigms, as well as an opportunity to join relevant discussions, exercises, and acts. Participants were, for instance, invited to express their opinions about the morality of obfuscation, to enter the role of data aggregators, and to develop their own obfuscation techniques.30 Involving collaborative work and critical reflection, the workshop went beyond performing an act of obfuscation, as the participants also studied the mechanisms and processes of data capture and challenged themselves to understand obfuscation as a form of resistance.

Overidentification

Overidentification is a known artistic strategy based on appropriating of a sovereign ideology with the aim of criticizing it in the most ambivalent way possible. As the BAVO architectural theory group explain, acts exemplary of this tendency confront the current world of "calculated cynicism" by purposefully "giving up their will to resist," and "applying the latter's rules even more consistently and scrupulously than the rest of society."31 Overidentification, as Inke Arns and Sylvia Sasse have specified, allows artists "to take part in certain social, ideological, political, or economic discourses and to affirm, appropriate, or consume them while simultaneously undermining them.32 Subversion, in this case, is ambivalent, as it accepts "the like-

lihood of being identified with the most demonic aspects of the regime" it aims to oppose.33 It involves staging, sabotage, mimicry, and fraud, which might create discomfort and unease as much as enjoyment.34

Overidentification has been embraced by artists opposing various systems of power. The use of totalitarian aesthetics by groups like Laibach and Neue Slowenische Kunst (NSK) in the 1980s and 1990s, the performative pranks of Yes Men, and the fake advertising and situations created by Eva and Franco Mattes (then acting as 0100101110101101.org) offer examples from previous decades. In recent years, overidentification has become less aggressive but more popular, as more artists purposefully embrace and apply its logic, exploiting weak points and moments in the systems of the connected world.35 Examples include Tobias Leingruber's *Social ID Bureau* (2012), where users could issue their own Facebook ID card, and the web application *Commodify.us* (2013), created by Walter Langelaar and Birgit Bachelor, which imitated the aesthetics of Facebook and invited users to decide themselves how to license their facebook data.36 Because of its ambivalent character, overidentification does not, at first, appear as a strategy for user empowerment. But these two projects were both accompanied by workshops, inviting participants to learn how they are perceived by opaque networks and develop subversive strategies in response.37

A recent interesting example that demonstrates how overidentification can be used methodologically in order to examine contemporary systems and structures of power can be found in the work of the Athens Subsumption Group.38 Introduced as a "shadow corporation" with the name Metaxication Inc., the members of the group run workshops that are supposed to "employ" people.39 In reality, Metaxication Inc. wishes to reveal contemporary processes of subsumption, and believes there is no better way of doing this than by "articulating the extremes of the system" and "appropriating the corporate way of thinking, seeing and interacting with the world."40 Their workshops start with a presentation and focus group that purposefully follows a business model, and then participants are asked to respond to tasks and decide whether they would like to be employed by the corporation, whose true nature they are not yet aware of. Us-

ing a process of "reverse imagineering," as Holmes once called it, they are therefore invited to join a workgroup of people engaging critically with issues concerning labor and subsumption today.41 "Metaxication Inc. is about the infrastructures and the systems we are all part of but we cannot see or control."42 The process of briefly tricking users into overidentification is used here in order to attract users' attention, to raise awareness and provoke them into engaging with these issues.

Estrangement

Estrangement or defamiliarization is an old artistic strategy with roots in Russian Formalism. A word for defamiliarization, *ostranie*, was coined by Russian theorist Viktor Shklovsky in 1917, and it became well-known when adopted by Bertolt Brecht in the late 1920s.43 In Brecht's words, estrangement can be achieved in the theater by "stripping the event of its self-evident, familiar, obvious quality and [by] creating a sense of astonishment and curiosity about them."44 Using techniques to surprise and distance the audience, the goal for Brecht was the spectators' critical—or even political—engagement as opposed to their ephemeral emotional involvement.45 The subversive quality of estrangement is also captured in the German translation for the word. *Entfremdung* means both "alienation" and "to get rid of alienation" suggesting not only the experience but strategies to deal with it.46

Following this logic, artists today embrace estrangement to make experiences "less natural and specifically more labored, as a way to allow audiences access to new ways of seeing and thinking."47 Distinctive examples within the field that are of interest for this paper can be found in the use of hacks, errors, and glitches to disrupt and challenge user experiences with digital media. It is worth, for instance, recalling how net artists used to disturb the browser experience when playing with the internet's inner structure, how artists working with games exposed and subverted game mechanics, and how glitch artists seek the accidental and the unfamiliar in different media. While they may discomfort or inconvenience users, these practices also succeed in exposing the limitations that digital media impose on

experience and, in doing so, challenge the usual assumptions.

In the last few years, estrangement became a strategy used by artists engaging with the materiality of digital culture. This may involve the reimagining of 3D printed objects, as the "3D Additivist Manifesto" suggests; the location and exposure of forgotten and eerie territories affected by the development of technology, as is often present in the work of Liam Young; or the creation of infrastructural sculptural formations, like Evan Roth's *Burial Ceremony* (2015), an infinity loop of fiber optic cables.₄₈ In all these cases a distancing from the familiar is achieved, one that allows the audience "to stand outside of the world" it is in and to "look back in on it."₄₉ Workshops accompanying projects achieve similar ends.

When artist Morehshin Allahyari and theorist Daniel Rourke published their "3D Additivist Manifesto" in 2015, they stated their wish to "encourage, interfere and reverse-engineer the possibilities encoded into the censored, the invisible, and the radical notion" of 3D printing. The manifesto was a call to artists, activists, designers, and engineers to take the "additivist technologies to their limits" and to question forms of resistance and emancipation. Workshops were organized to support this purposefully ambiguous and provocative manifesto. Embracing "the speculative, the provocative and the weird" the artists were interested in the potentiality of objects that have never existed before, like "ruins, cracks, fissures and flaws" that can take on "a life of their own."₅₀ Could 3D printing be used to build tools for tomorrow's art activism, taking a distance from the usual promises and narratives of maker culture? In their model of workshop, participants are invited to design 3D "disobedient objects" and discuss their potentiality as tools for political and social movements. As "dystopia, horror and weirding" are used methodologically, a technology like 3D printing becomes strange, disrupting its own revolutionary narrative and opening new interpretations and approaches.₅₁

CONCLUSION

Studying how artistic strategies are deployed to allow users to understand complex mechanisms of power, the emergence of new subversive methodologies becomes apparent. Though each case is different, it is possible to make some conclusions about the possibilities for soft power in new media.

Firstly, it should be taken into consideration that workshops cannot but reflect an artist's practice. They offer what Fuller describes as "a range of ways of sensing, doing and knowing" that can only be located in "art methodologies."₅₂ The acts of subversion performed by artists within this context inspire and shape the concept, methods and goals of workshops, often building a strong connection between the two. A plug-in like *AdNauseam* or a manifesto like that of Allahyari and Rourke offer, for instance, the starting point and the basis for participatory and discursive workshops. The features of a strategy, like the performativity of obfuscation or the distancing effect of estrangement, respectively influence the methods used. Otherwise static or finite projects are thus activated, while ideas are communicated and strategies are tested.

Secondly, the methodologies deployed in the workshops are open for appropriation and modification by users. This is beneficial not only for the participants but also for the artists themselves, who can see their work completed in different ways. In this way subversion possibly recuperates an old attribute of Situationist *détournement*, when it was understood "as a commons" expanding beyond the sphere of art and opening up to different fields of everyday life.₅₃ The desire and necessity is now for users to be "tactical, creative and innovative in order to leverage power," according to Anab Jain, an idea that brings us back to the approaches of Bureau d'Etudes and Scott about how "reverse engineering" and "culturehacking" can be appropriated.₅₄

Thirdly, these artistic, subversive methodologies can be considered as expressions of a term Philip Agre introduced and Michael Dieter recently revisited: "Critical Technical Practice," which emphasizes the need to frame questions when problems are being addressed, bridging practical with reflexive work.₅₅ While core ideas of artistic strategies are theoretically contextualized in artist workshops, a tangibility to materiality—from examining real data sets to designing critical prototypes—is also present. A process of problematization with the issues at

stake is what is mostly encouraged, interrupting usual habits and ways of engagement with today's systems.56

Finally, subversive artistic methodologies are by nature affective. The methodological shift to constructive learning environments reflects the will and anxiety of today's artists to bring to light their ideas, knowledge, and methods and to equip others with them. In a time when the logic of subversion has been appropriated by states and markets, users need not only to be aware of but also to perceive and understand how mechanisms and processes of power actually work. It is within this context that subversion has started to change, becoming a drive for mobilizing users through knowledge.

This new form of soft subversion is an ongoing open process toward a new "collective consciousness" and a new "collective language."57 Artists are responding to an urge for new methods of thinking and acting that would be useful to broad communities of users. Today's forms of artistic subversion are therefore soft, but also disobedient. They address a call for what Rancière framed as the "collectivization of capacities" which, invested in dissensus and based on the affective character of art, aim to reconfigure "what can be said and thought."58 For this reason, they purposefully shift our attention from the already old question of what is left to subvert to what it would take to create the conditions for subversion—and how more than a few can be actively involved in this process.

1    For a discussion of disillusionment and the post-digital see Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (2014), http://www.aprja.net/?p=1318

2    McKenzie Wark, "A Ludic Century," *Public Seminar*, November 22, 2013, http://www.publicseminar .org/2013/11/a-ludic-century/ (all links accessed September 20, 2016).

3    Dieter Daniels, "Subversion as Strategy Today?" in *Political Interventions* (Zurich: Migros-Kultur-prozent, 2014).

4    Brian Holmes references Mario Tronti. Holmes, "Recapturing Subversion: Twenty Twisted Rules of the Culture Game," 2008, https://brianholmes.wordpress.com/2008/05/18/recapturing-subversion/.

5    Ibid.

6    See Alexander Galloway, interview with Manuel Correa, "The Philosphical Origins of Digitality," *&&& Journal*, http://tripleampersand.org/the-philosophical-origins-of-digitality/.

7    Tung-Hui Hu, *Prehistory of the Cloud* (Cambridge, MA: MIT Press, 2015), 118–19.

8    Nicholas A. Knouf, "Communication in the Wake of Snowden," *Media-N, Journal of the New Media Caucus* 10, no. 3 (2014); The Institute for Precarious Consciousness, "We Are All Very Anxious," *We Are Plan C*, http://www.weareplanc.org/blog/we-are-all-very-anxious/.

9    Tung-Hui Hu, *Prehistory of the Cloud* (Cambridge, MA: MIT Press, 2015), 11, 139.

10   Alexander Galloway and Eugene Thacker, *The Exploit: A Theory of Network* (Minneapolis: University of Minnesota Press, 2007), 81.

11   Michel Foucault, *The History of Sexuality, Volume 1: An Introduction*, trans. Robert Hurley (New York: Pantheon Books, 1978), 86.

12   As Brian Holmes quotes from a hackers' manual, reverse engineering "is simply the act of figuring out what software that you have no source code for does in a particular feature or function, to the degree that you can either modify this code, or reproduce it in another independent work. Holmes, "Reverse Imagineering: Toward the New Urban Struggles," 2004, https://brianholmes.wordpress.com/2004/01/29/ reverse-imagineering/.

13   Ibid.

14   Alex King, "Five Things You Need to Know about Culturehacking," *Huck*, February 5, 2016 http://www .huckmagazine.com/art-and-culture/five-things-need-know-culturehacking/; Brett Scott, *The Heretic's Guide to Global Finance: Hacking the Future of Money* (London: Pluto Press, 2013).

15   Wendy Hui Kyong Chun, *Control and Freedom: Power and Paranoia in the Age of Fiber Optics* (Cambridge, MA: MIT Press, 2008), 5.

16   Félix Guattari as discussed in Clemens Apprich, "Remaking Media Practices: From Tactical Media to Post-media," in *Provocative Alloys: A Post-media Anthology*, eds. Clemens Apprich et al. (Leuphana: Post-Media Lab & Mute Books, 2013), 134.

17   Tiziana Terranova, *Network Culture: Politics for the Information Age* (London: Pluto Press, 2004), 120; Joshua G. Tanenbaum et al., "Democratizing Technology: Pleasure, Utility and Expressiveness in DIY and Maker Practice," *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems* (New York: ACM Digital Library, 2013), 2609.

18   Δημήτρης Παπαλεξόπουλος, "Fab Labs. Συμπλέγματα γνώσης και τεχνολογίας," *archtech* National Technical University of Athens, School of Architecture, 2013.

19   Julian Oliver et al., "The Critical Engineering Manifesto," 2011, https://criticalengineering.org/.

20   Jacques Rancière, *The Emancipated Spectator* (London: Verso, 2009), 49.

21   Michel Foucault as quoted in Jeffrey Thomas Nealon, *Foucault beyond Foucault: Power and its Intensifications since 1984* (Stanford: Stanford University Press, 2008), 104.

22   Michel Foucault, "What Is Critique?" in *The Politics of Truth*, trans. Lysa Hochroth (Los Angeles: Semiotext(e), 2007).

23   Michael Dieter argues that "critique arises through voluntary disobedience," referring to Foucault's understanding and analysis in Dieter, "The Virtues of Critical Technical Practice," *differences: A Journal of Feminist Cultural Studies* 25, no. 1 (2014): 219.

24   Helen Nissenbaum and Finn Brunton, "Vernacular Resistance to Data Collection and Analysis: A Political Theory," *First Monday* 16, no. 5 (2011), http://firstmonday.org/article/view/3493/2955.

25   Anna Munster, "Data Undermining: The Work of Networked Art in an Age of Imperceptibility," in *Networked: a (networked_book) about (networked_art)*, http://munster.networkedbook.org/data -undermining-the-work-of-networked-art-in-an-age-of-imperceptibility/.

26   Galloway and Thacker, 135.

27   Ben Grosser, *ScareMail*, 2013, https://bengrosser.com/projects/scaremail/.

28   Zach Blas, *Facial Weaponization Suite*, 2011–14, http://www.zachblas.info/works/facial-weaponization-suite.

29   As stated by the artists in the introduction of the workshop. Mushon Zer-Aviv Daniel Howe, workshop documentation, personal archive (2015).

30   Ibid.

31   BAVO, "Introduction: Cultural Activism," in *Cultural Activism Today: The Art of Over-Identification*, ed. BAVO (Rotterdam: Episode Publishers, 2007), 6.

32   Inke Arns and Sylvia Sasse. "Subversive Affirmation: On Mimesis as a Strategy of Resistance," in *East Art Map: Contemporary Art and Eastern Europe*, ed. IRWIN (London: Afterall, 2006), 445.

33   Stephen Shukaitis, "Fascists as Much as Painters: Imagination, Overidentification, and Strategies of Intervention," *The Sociological Review* 59, no. 3 (2011): 597–615.

34   Benda Hofmeyr, "Artistic Over-Identification: Overrated or Underestimated? A Reevaluation of Atelier Van Lieshout's Activism," in *Cultural Activism Today* 76; Kostis Stafylakis, "Fragile Overidentifications:

Emerging Alternatives in Greece's Cultural Activist Scenes," *Left Curve* 37 (2013): 72.

35 Overidentification shares common attributes with the practice of accelerationism today, but whereas the former clearly has undermining power structures as its goal, the latter suggests an intensification and radicalization of capitalism when subversion is thought to be no longer possible.

36 Social ID Bureau, http://socialidbureau.com/; Commodify.us, http://commodify.us/.

37 Workshops related to the Social ID Bureau were held in the context of the Unlike Us event in Amsterdam in 2013. The work itself was hosted as a performance in Supermarkt in Berlin in 2012 and a workshop followed in 2014. A "Commodify Us: Data Commodification" workshop was hosted at transmediale 2015 in Berlin.

38 The Athens Subsumption Group was created after the workshop "Enclosures of New Athens," which took place in Athens in 2015. It was led by Oliver Lerone Schultz as part of the New Babylon Revisited project that I curated with Sophia Dona. It continued with a new workshop at transmediale 15 and Metaxication Inc. was later presented at the Athens Digital Arts Festival in 2015.

39 "Metaxication Inc.," video, 2015 https://vimeo.com/128644072.

40 Interview with Maria Byck, 2016.

41 Holmes, "Reverse Imagineering."

42 Interview with Byck.

43 Anke Hennig, "Estrangement: A Retro-Vision for 2016," in *OnCurating*, no. 31 (2016): 5–9.

44 Brecht as quoted in Peter Brooker "Key Words in Brecht's Theory and Practice of Theatre," *The Cambridge Companion to Brecht 2*, eds. Peter Thomson and Glendyr Sacks (Cambridge, MA: Cambridge Press, 1994), 191.

45 Susan Benett underlines how Brecht differed, compared to existing modes of production and perception of his period. Bennet, *Theater Audiences: A Theory of Production and Reception* (Oxon: Routledge, 1997), 27–28.

46 Hennig, "Estrangement."

47 Joey Cannizzaro, "Like When the Teacher Leaves the Classroom: A Conversation about Artist-Run Programming within Exhibitions," in *OnCurating*, no. 31 (2016): 24.

48 Morehshin Allahyari and Daniel Rourke, "3D Additivist Manifesto," *2015,* http://additivism.org/manifesto; Landscapes of forgotten territories are especially present in the videos produced by Liam Young in col-laboration with Kate Davies and a group of participants in their "Unknown Fields Division" expeditions: http://www.unknownfieldsdivision.com/; *Burial Ceremony,* 2015, http://www.evan-roth.com/work/burial'-ceremony/.

49 George Kafka, interview with Liam Young, "The Model Is the Map Is the Territory," transmediale (blog), March 14, 2016, https://2016.transmediale.de/content/the-model-is-the-map-is-the-territory.

50 Allahyari and Rourke, *The 3D Additivist Manifesto.*

51 transmediale, call for workshop participation, "Design beyond the Human: An Introduction to the 3D Additivist Cookbook," https://transmediale.de/content/additivism-workshop-and-talk.

52 Matthew Fuller, "Art Methodologies in Media Ecology," in *Deleuze, Guattari, and the Production of the New*, eds. Simon O'Sullivan et al. (London: Continuum, 2008).

53 As discussed in McKenzie Wark, "Wendy Chun, On Software and the Machine," *Public Seminar*, July 5, 2015, http://www.publicseminar.org/2015/07/wendy-chun-on-software-and-the-machine*/*.

54 Anab Jain, "How Will We Live," lecture transcription, October, 16, 2015, http://www.superflux.in/blog/howwillwelive.

55 Philip Agre, "Toward a Critical Technical Practice: Lessons Learned in Trying to Reform AI," in *Bridging the Great Divide: Social Science, Technical Systems, and Cooperative Work*, eds. Geoffery Bowker et al. (Hillsdale: Erlbaum, 1997); Michael Dieter, "The Virtues of Critical Technical Practice."

56 Dieter, "The Virtues of Critical Technical Practice," 219.

57 Ryan Gallagher refers to the importance of collective consciousness in an interview with Alex King: "Five things you need to know about culturehacking"; Rossiter and Zehle discuss the need to develop a collective language in an interview with Daniel de Zeeuw, "Piracy, Anonymity & Parametric Politics," OpenLearn, August 25, 2015, http://www.open.edu/openlearn/history-the-arts/culture/philosophy/concepts/piracy-anonymity-parametric-politics-interview-ned-rossiter-and-soenke-zehle.

58 Jacques Rancière, *The Emancipated Spectator*, 49.

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**Danja Vasiliev** is a Critical Engineer from Saint-Petersburg, living and working in Berlin. Since 1999 Vasiliev has been involved in art and technology events around the world. He has received a number of awards and mentions at Ars Electronica, Japan Media Art Festival, and transmediale, among others. Together with his colleagues Julian Oliver and Gordan Savičić, Vasiliev co-authored "The Critical Engineering Manifesto."

# Julian Oliver & Danja Vasiliev
# Quarantined

## Quarantined

Our Critical Engineering Working Group was invited to bring the second iteration of our project *PRISM* to transmediale 2014's central exhibition, "ArtHackDay." The curatorial frame sought to foreground hacking antics, tools, and methods within media art-making and as such audiences were promised a playful and mischievous expression of that agenda.

This frame suited us very well, as we were eager for an opportunity to enact an infrastructural intervention too dangerous for an urban outdoor setting: "catching" hundreds of mobile phones with a rogue cell tower we built and spent several weeks tuning. Alongside, we aimed to track and map each device in the exhibition using a method known as trilateration. After successfully fooling handsets to connect to our base station, it was our goal to push SMS messages to each device without needing to know their phone numbers. We called this iteration of our project *The Beacon Frame*.

Known as an IMSI catcher (IMSIs are the unique numbers in a mobile phone's SIM card), the possession of such systems by civilians is completely prohibited in most countries, and yet they are now widely used by spies, law enforcement, and military. It is hardly a generalization to assert that monopoly of spectrum is now as central as the monopoly of violence to the modern State.

The SMS messages we had written were a satirical, paranoid, and timely reflection on the then-recent Snowden revelations that the NSA had not only compromised German cellular networks, but were actively engaged in spying on the Bundestag (German Parliament) via a rogue cell tower atop the US Embassy next door. Importantly, the Bundestag was less than a kilometer from the Haus Der Kulturen Der Welt, the building housing transmediale. This

placed *PRISM* geographically close to the historical breach such that it could manifest as a sort of situated reenactment.

Though the spying scandal tore through the German press, enraging politicians and public alike, the American exploit of German networks might as well have existed only in the imaginary; there were no fingerprints on devices, no signs of a break-in — just a PDF and a few aerial photographs of innocuous rectilinear structures atop a building. One could have been spied on, or not, and so it was our project to both publicly materialize the technology used (based on our best understanding of it) and deploy the same operational logic of "involuntary participation" that the NSA used to compromise cellular infrastructure in the first instance.

Without such direct exposure, we believed, a sorely needed public conversation about surveillance statecraft would be yet again lost to fiction; television shows and movies are prolific and exaggerated in their imaginings of spy agencies and their technological capabilities, a siege of representation that continues to baffle those same publics actually targeted in the real. transmediale was equally eager to have us realize this for the event and after a difficult install with plenty of support it seemed to be running quite well.

On the opening night things went even better than hoped; we successfully pushed text data onto at least 740 phones, many of whose owners gleefully shared screenshots across Instagram, Twitter, Facebook, and the like.

The surprise was clear, yet so too was a seemingly general guess that the otherwise unsigned intervention was by the "Critical Engineers." Oursought-after project of audience development, to engender a healthy

paranoia, was also expressed on and offline, yet nowhere were we positioned as an antagonizing interest. Quite the contrary.

The piece continued to work its way into people's pockets into the next day, until we were called in by the festival director to meet with him and the private audiovisual company serving transmediale. This company had cut the piece down without forewarning following a "complaint" and then "quarantined" it in their office. In the meeting it was made clear to us that putting it back up would result in reporting us to the federal police — in Germany, running a rogue cell tower could mean facing huge fines and up to five years of jail time. As transmediale deemed it impossible to back us financially or legally in the event of arrest, we defaulted to leaving it offline.

We wrote a public letter about the takedown just as multiple English and German news sources picked up on the event:

✉ **We, the creators of PRISM: The Beacon Frame, wish to express our disappointment at the disabling of a crucial element of this work at transmediale 2014, with the threat of reporting us to the German Federal Police. As such, we've agreed that it is not in our interests to maintain the work in its original form.**

**It was our intention to provide an opportunity for the public to critically engage precisely the same methods of cellular communications interception used by certain governments against their own people and people in sovereign states. It was not, in any way, our intention to harm anyone and nor did we.**

**We note that the German Parliament, right next door, has suffered directly by way of such violations.**

**It is vital that technology-based art remain a frame with which we can develop critical discourses about the world we live in, from the engineered to the cultural and political. Sometimes that requires that we are not limited by exaggerated fears and legal definition, but that we act proportionally and with conscience in our efforts to understand the power struggles and tensions in our (technically mediated) environment.**

**Sometimes this means taking risks, risks without intention to harm but to engender wider critical insights.**

**We wish to thank the festival director and the curatorial team from ArtHackDay and LEAP for representing us to the best of their ability.**

**The Critical Engineer considers the exploit to be the most desirable form of exposure.**

**Julian Oliver, Danja Vasiliev**

Engineering is far too important to be left to the experts — to academic papers, patents, military and corporate research facilities … contract audiovisual companies. The cultural conversation we call Art is challenging aesthetic, social, cultural, and political habits and regimes to better understand how we are their subjects. In today's world of integrated and automated systems, complex communication networks and their technologies, there is no less need for such subjective transformation. Only by doing so can new mobilities (and thus futures) be modeled.

Without insulation from state intervention by art infrastructure, there would be no safe, public forum for techno-political expression, no context for understanding how our increasingly engineered environment engineers us. But a black box made of many.

This text was adapted to American English from the original, written in British English.

Spying Reform 2014-A6. Embrace Our Transparency.

# Tiziana Terranova
# Red Stack Attack! Algorithms, Capital, and the Automation of the Common [1]

At stake in the following is the relationship between "algorithms" and "capital"—that is, the increasing centrality of algorithms "to organizational practices arising out of the centrality of information and communication technologies stretching all the way from production to circulation, from industrial logistics to financial speculation, from urban planning and design to social communication."[2] How should we grasp the relation between algorithms, processes of valorization of users' activities in networked digital media, and possibilities for emancipation from capital's stronghold over social cooperation? Are algorithms inevitably bonded to forms of control as regulations that are incompatible with any post-capitalist mode of production? Should they ever be considered part of efforts to exit neoliberal capitalism? If the concept of the common refers to "the product of [...] forms of governing and social co-operation," as opposed to simply "an intrinsic feature of the nature of particular categories of goods," as in the notion of the commons, how can we reclaim self-governance and networked, techno-social cooperation from capitalist enclosure and rent?[3]

We could start with considering how algorithms, those apparently esoteric computational structures, have become part of the daily life of users of contemporary digital and networked media. Users of the internet interface with (or are subjected to) the power of algorithms every day: Google's PageRank (which sorts the results of search queries) or Facebook's EdgeRank (which automatically decides the order in which we should see news on our feeds), for example, not to speak of the many other lesser-known algorithms (Appinions, Klout, Hummingbird, PKC, Perlin noise, Cinematch, KDP Select, and many more) that modulate our relationships with data, digital devices, and each other. This widespread presence of algorithms in the daily life of digital culture, however, is only one of the expressions of the pervasiveness of computational techniques as they become increasingly coextensive

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with processes of production, consumption, and distribution displayed in logistics, finance, architecture, medicine, urban planning, infographics, advertising, dating, gaming, publishing, and all kinds of creative expression (music, graphics, dance, and so on).

The staging of the encounter between algorithms and capital as a political problem invokes the possibility of breaking the spell of capitalist realism—that is, the idea that capitalism constitutes the only possible way to organize our productive activities while at the same time claiming that new ways of organizing the production and distribution of wealth need to seize on scientific and technological developments.[4] Going beyond the opposition between state and market, or public and private, the concept of the common is used here as a way to instigate the thought and practice of a possible postcapitalist mode of existence for social cooperation in networked digital media.

## ALGORITHMS, CAPITAL, AND AUTOMATION

Discussions about the potential of computational networks in enabling a postcapitalist economy tend to revolve around concepts of the commons or the common. Writings about commons-based peer production tend to privilege the notion of commons as a good, mostly drawing on Elinor Ostrom's framework, thus suggesting that peer production is primarily enabled by the specific character of information as a nonrival good—a good that can be enjoyed in common.[5] In his early essay about "peer production," for example, Yochai Benkler draws a difference between "commons-based peer production" and "peer production" as involving a difference in regimes of property. Peer production, for Benkler, refers to "instances of socially productive behavior" or "large- and medium-scale collaborations among individuals that are organized without markets or managerial hierarchies."[6] He characterizes commons-based peer production in the classic terms provided by literature on natural commons, and redeploys them to deal with knowledge commons: "non-proprietary regimes" or "absence of exclusion"; whether the use of the commons is open

to anybody in the world or limited; whether it is self-regulated or not; according to the means of provisioning and allocating resources. Theorists of the common, however, argue that, in Ostrom's theory of the commons, "what remains as a central element defining common goods is the particular nature of certain goods, in continuity with the ahistorical and static approach to classification of goods (private, public, common, belonging to a club) driven by neo-classical inspired economic theory."[7] Drawing on Michael Hardt and Antonio Negri, Carlo Vercellone and his co-authors argue that the common is the "socially and historically determinate activity that incessantly produces new institutions, which are at the same time the conditions and result of 'common' itself."[8] As such, while the notion of the commons is dependent on a classification of different types of goods (private, public, and common), the concept of the common refers to "cognitive labor and knowledge […] as the common element that establishes and renders possible the social structure of any type of commons, independently of the nature of the goods, whether they be material or immaterial, subject to the constraints of scarcity or abundant."[9] Thus for theorists of the common, the matter is not identifying which goods seem to qualify best for "commons-based peer production," but how the common as a political concept indicates the centrality of bio-cognitive labor and social cooperation to value production and the necessity of conceiving new political horizons that acknowledge the increasingly social nature of production in ways that reward and sustain it.

Looking at algorithms from a perspective that seeks the constitution of a new political rationality around the concept of the common means engaging with the ways in which algorithms are deeply implicated in the changing nature of automation. If what Vercellone, Fumagalli, and others call "bio-cognitive capitalism" intensifies the cooperative nature of labor, then algorithms become signs of a new mode of automation with relation to the industrial model described by Marx. Marx describes automation as a process of absorption into the machine of the "general productive forces of the social brain," such as "knowledge and skills" that therefore appear as an attribute of capital rather than as the product of social

labor.[10] Looking at the history of capital and technology, it is clear how automation has evolved away from the thermo-mechanical model of the early industrial assembly line toward the electro-computational, dispersed networks of contemporary capitalism. Hence it is possible to read algorithms as part of a genealogical line that, as Marx put it in his "Fragment on Machines," started with the adoption of technology by capitalism as fixed capital, then pushed the former through several metamorphoses "whose culmination is the machine, or rather, an automatic system of machinery […] set in motion by an automaton, a moving power that moves itself."[11] The industrial automaton was clearly thermodynamic, and gave rise to a system "consisting of numerous mechanical and intellectual organs so that workers themselves are cast merely as its conscious linkages."[12] It implied a cognitive division of labor within the factory, where organizational knowledge was the exclusive domain of white-collar workers, while blue-collar workers toiled on the factory floor—and the reproductive work of women went unacknowledged.[13] The digital automaton, however, is electro-computational: it "puts the soul to work," it primarily involves the nervous system and the brain, it comprises "possibilities of virtuality, simulation, abstraction, feedback and autonomous processes," and it does not presuppose a gendered division between productive and reproductive work, even as it engenders its own modes of sexualization.[14] The digital automaton unfolds in networks consisting of electronic and nervous connections so that users themselves are cast as quasi-automatic relays of a ceaseless information flow. It is in this wider assemblage, then, that algorithms need to be located when discussing new modes of automation.

Quoting a textbook of computer science, Andrew Goffey describes algorithms as "the unifying concept for all the activities which computer scientists engage in […] and the fundamental entity with which computer scientists operate."[15] An algorithm can be provisionally defined as the "description of the method by which a task is to be accomplished" by means of sequences of steps or instructions that operate according to data and computational structures. As such, an algorithm is an abstraction "having an autonomous existence independent

of what computer scientists like to refer to as 'implementation details,' that is, its embodiment in a particular programming language for a particular machine architecture."[16] It can vary in complexity from the most simple set of rules described in natural language (such as those used to generate coordinated patterns of movement in smart mobs) to the most complex mathematical formulas involving all kinds of variables (as in the famous Monte Carlo algorithm used to solve problems in nuclear physics, which was later applied to stock markets and now to the study of nonlinear technological diffusion processes). At the same time, in order to work, algorithms must exist as part of assemblages that include hardware, data, data structures (such as lists, databases, and memory), and the behaviors and actions of bodies. For the algorithm to become social software, in fact, "it must gain its power as a social or cultural artifact and process by means of a better and better accommodation to behaviors and bodies which happen on its outside."[17] Furthermore, for Luciana Parisi, the ingression of the logic of computation into culture marks the transformation of algorithms from "instructions to be performed" into "performing entities." This transformation is linked to the "entropic tendency of data to increase in size," which causes "infinite amounts of information [to] interfere with and re-program algorithmic procedures."[18] For Parisi, this "new function of algorithms thus involves not the reduction of data to binary digits, but the ingression of random quantities into computation." Hence, algorithms are neither a homogeneous set of techniques, nor do they guarantee "the infallible execution of automated order and control."[19] They do not simply correspond to a new mode of "algorithmic regulation" that ensures the smooth optimization of all kinds of processes, but confront governance with "data that produce alien rules," rules that are "at once discrete and infinite, united and fractalized."[20] Or, as theorists of the common would put it, when algorithms meet the infinite data produced by social cooperation, they do not achieve a smooth control but are confronted with an excess, that is, a surplus, which causes the capitalist governance of bio-cognitive labor to face new indeterminacies.

From the point of view of capitalism, on the other hand, algorithms are mainly a form of fixed capital—they are just means of production. They encode a certain quantity of social knowledge (abstracted from that elaborated by mathematicians, programmers, and also users' activities), but they are not valuable per se. In the current economy, they are valuable only inasmuch as they allow for the conversion of knowledge into exchange value (monetization) and its exponentially increasing accumulation (the titanic quasi-monopolies of the social internet). Insofar as they constitute fixed capital, algorithms such as Google's PageRank and Facebook's EdgeRank appear "as a presupposition against which the value-creating power of the individual labour capacity is an infinitesimal, vanishing magnitude," and that is why calls for individual retributions to users for their "free labor" are misplaced.[21] It is clear that, for Marx, what needed to be compensated was not the individual work of the user, but the much larger powers of social cooperation thus unleashed. This compensation implies a profound transformation of the grip that the social relation that we call the capitalist economy has on society.

From the point of view of capital, algorithms are fixed capital, assets that work as means of production finalized to achieve an economic return. But, like all technologies and techniques, that is not all they are. Marx explicitly states that, even though capital appropriates technology as the most effective form of the subsumption of labor, this is not all that can be said about it. Its existence as machinery, he insists, is not "identical with its existence as capital […] and therefore it does not follow that subsumption under the social relation of capital is the most appropriate and ultimate social relation of production for the application of machinery."[22] It is then essential to remember that the instrumental value that algorithms have for capital does not exhaust the value of technology in general and algorithms in particular—that is, their capacity to express not just "use value" as Marx put it, but also aesthetic, existential, social, and ethical values. Wasn't it this clash between the necessity of capital to enclose software in order to enforce the value of private property over cooperative tinkering that pushed Richard Stallman and countless hackers

and engineers toward the Free Software Movement? Isn't the enthusiasm that animates hacker meetings and hackerspaces fueled by the energy liberated from the constraints of working for a company in order to remain faithful to one's own aesthetics and ethics of coding?

Contrary to some variants of Marxism that tend to identify technology completely with "fixed capital," "dead labor," or "instrumental rationality," and hence with control and capture, it is important to remember how, for Marx, the evolution of machinery also indexes a level of development of productive powers that are unleashed but never totally contained by the capitalist economy. What interested Marx (and what makes his work still relevant to those who strive for a postcapitalist mode of existence) is the way in which, so he claims, the tendency of capital to invest in technology to automate and hence reduce its labor costs to a minimum potentially frees up a surplus of time and energy (labor), or an excess of productive capacity. However, what characterizes a capitalist economy is that this surplus of time and energy is not simply released, but must be constantly reabsorbed in the cycle of production of exchange value, leading to the increasing accumulation of wealth by the few (the collective capitalist) at the expense of the many (the multitudes).

Automation, then, when seen from the point of view of capital, must always be balanced with new ways to control (that is, absorb and exhaust) the time and energy released by it. It must produce poverty and stress when there should be wealth and leisure. It must make direct labor the measure of value, even when it is apparent that science, technology, and social cooperation constitute the source of the wealth produced. It thus inevitably leads to the periodic and widespread destruction of this accumulated wealth, in the form of psychic burnout, environmental catastrophe, and physical destruction of wealth through war. It creates hunger where there should be satiety; it puts food banks next to the homes of the super-rich. That is why the notion of a postcapitalist mode of existence must become believable, that is, it must become what Maurizio Lazzarato described as an enduring autonomous focus of subjectivation.23 What a postcapitalist common can aim for is

not only a better distribution of wealth compared to the unsustainable one that we have today, but also a reclaiming of disposable time—the time and energy freed from work to be deployed in developing and complicating the very notion of what is necessary. This disposable time is a key component of an economy organized around the "common in the singular."24 This could constitute a revitalization of the tradition of "red cybernetics," outlined, for example, by Nick Dyer-Witheford and Eden Medina, in ways which relink communism to democracy, freedom, and the respect for singularities that were previously foreclosed by the socialist planner state.25

The history of capitalism has shown that automation as such has not reduced the quantity and intensity of labor demanded by managers and capitalists. On the contrary, as far as technology is only a means of production to capital, where it has been able to deploy other means, it has not innovated. For example, industrial technologies of automation in the factory do not seem to have recently experienced any significant technological breakthroughs. Most industrial labor today is still heavily manual, automated only in the sense of being hooked up to fast electronic networks of prototyping, marketing, and distribution; and it is rendered economically sustainable only by political means—by exploiting geopolitical and economic differences (arbitrage) on a global scale, and by controlling migration flows through new technologies of the border.26 The state of things in most industries today is intensified exploitation, which produces an impoverished mode of mass production and consumption that is damaging to the body, subjectivity, social relations, and the environment. As Marx put it, disposable time released by automation should allow for a change to the very essence of the human, so that the new subjectivity is allowed to return to the performing of necessary labor in such a way as to redefine what is necessary beyond the limits of predefined needs and motivations.

The notion that the common is a mode of production then, does not imply that we should return to simpler times by defining the real basic needs that we need to satisfy, but, on the contrary, a matter of acknowledging that growing food and feeding populations, constructing shelter and adequate hous-

ing, learning and researching, caring for children, the sick, and the elderly, facing the challenges of climate change, choosing one's forms of spirituality (a relation to the forces of subjectification that exceed oneself) requires the mobilization of social invention and cooperation.27 The whole process of labor is thus transformed from a process of production for the few by the many, steeped in impoverishment and stress, to one where the many redefine the meaning of what is necessary and valuable, while inventing new ways of achieving it. This corresponds in a way to the notion of "commonfare," as recently elaborated by Andrea Fumagalli and Carlo Vercellone, implying, in the latter's words, "the socialization of investment and money and the question of the modes of management and organisation which allow for an authentic democratic reappropriation of the institutions of Welfare [...] and the ecologic re-structuring of our systems of production."28 We need to ask, then, not only how algorithmic automation works today (mainly in terms of control, monetization, and feeding the debt economy), but also what kind of time and energy it subsumes, and how it might be made to work by different social and political assemblages that are not completely subsumed by or subjected to the capitalist drives toward accumulation and exploitation.

## THE RED STACK: VIRTUAL MONEY, SOCIAL NETWORKS, BIO-HYPERMEDIA

In his 2012 lecture at the Berlage Institute, later developed in his book *The Stack: On Software and Sovereignty*, digital media and political theorist Benjamin H. Bratton argued that we are witnessing the emergence of a new nomos of the earth, where older geopolitical divisions linked to territorial sovereign powers are intersecting with the new nomos of the internet and new forms of sovereignty extending in electronic space.29 This new heterogeneous nomos involves the overlapping of national governments (China, United States, European Union, Brazil, Egypt, and others), transnational bodies (the IMF, the WTO, the European Banks, and NGOs of various types), and corporations (such as Google, Facebook, Apple, and Amazon), producing differentiated patterns of mutual accommodation

marked by moments of conflict. Drawing on the organizational structure of computer networks or "the OSI network model, upon which the TCP/IP stack and the global internet itself is indirectly based," Bratton has developed the concept and/or prototype of the "stack" to define the features of "a possible new nomos of the earth linking technology, nature and the human."30 The stack supports and modulates a kind of "social cybernetics" able to compose "both equilibrium and emergence." As a "megastructure," the stack implies

> a confluence of interoperable standards-based complex material-information systems of systems, organized according to a vertical section, topographic model of layers and protocols [...] composed equally of social, human and "analog" layers (chthonic energy sources, gestures, affects, user-actants, interfaces, cities and streets, rooms and buildings, organic and inorganic envelopes) and informational, non-human computational and 'digital' layers (multiplexed fiber optic cables, datacenters, databases, data standards and protocols, urban-scale networks, embedded systems, universal addressing tables).31

In this section, drawing on Bratton's political prototype, I would like to propose the concept of the "red stack"—that is, a new nomos for the postcapitalist common. I will start by proposing at least three layers of the red stack, which remains, however, a modular structure with its own indeterminacies and virtualities. These layers are: virtual money, social networks, and bio-hypermedia. These three levels, although "stacked," that is, layered, are to be understood as interacting transversally and nonlinearly. They constitute a possible way to think about an infrastructure of autonomization linking together technology and subjectivation.

## VIRTUAL MONEY

The contemporary economy, as Christian Marazzi and others have argued, is founded on a form of money ("fiat money") which has been turned into a series of signs with no fixed refer-

ent (such as gold) to anchor them, explicitly dependent on the computational automation of simulational models, screen media with automated displays of data (indexes, graphics, and so on), and algo-trading (bot-to-bot transactions) as its emerging mode of automation.32 Such money is mainly emitted (like the sign it is) as a result of expectations of future revenues which, expanding into indeterminate futures, are allowed to increase to enormous size. As Robert Meister has argued, the liquidity of financial markets is ultimately dependent on government bonds, with national governments becoming the "lenders of last resort," which ensures that monetary production can continue by enforcing debt repayment from a nation's citizens in the form of cuts to public services and wages, foreclosures, and taxation. Our capacity to assume debt, for Meister, is becoming almost as important as our labor for the purposes of creating the vehicles for capital accumulation.33

As Antonio Negri also puts it, "money today—as abstract machine—has taken on the peculiar function of supreme measure of the values extracted out of society in the real subsumption of the latter under capital."34 Since ownership and control of capital-money (which is different, as Maurizio Lazzarato reminds us, from wage-money, in its capacity to be used not only as a means of exchange, but as a means of investment, empowering certain futures over others) is crucial to maintaining populations bonded to the current power relation, how could we turn financial money into the money of the common? An experiment such as Bitcoin demonstrates that, in a way, "the taboo on money has been broken," and that, beyond the limits of this experience, forkings are already developing in different directions.35 What kind of relationship can be established between the algorithms of money-creation and "a constituent practice which affirms other criteria for the measurement of wealth, valorizing new and old collective needs outside the logic of finance"?36 Current attempts to develop new kinds of cryptocurrencies must be judged, valued, and rethought on the basis of this simple question, as posed by Andrea Fumagalli: is the currency created not limited solely to being a means of exchange, but can it also affect the entire cycle of money creation, from finance to exchange?37 Does it allow speculation

and hoarding, or does it promote investment in postcapitalist projects and facilitate freedom from exploitation and autonomy of organization? What is becoming increasingly clear is that algorithms are an essential part of the process of creation of the money of the common, but that algorithms also have politics. (What are the gendered politics of individual "mining," for example, and of the complex technical knowledge and machinery implied in mining Bitcoins?) Furthermore, the drive to completely automate money production in order to escape the fallacies of subjective factors and social relations might cause such relations to come back in the form of speculative trading. In the same way as financial capital is intrinsically linked to a certain kind of subjectivity (the financial predator typically narrated by Hollywood cinema), so an autonomous form of money needs to be both jacked into and productive of a new kind of subjectivity—not limited to the hacking milieu as such, and oriented not toward monetization and accumulation, but toward the empowering of social cooperation.

Other questions that the design of the money of the common might involve are: by what means can we subtract money from the circuit of capitalist accumulation and turn it into money able to finance new forms of commonfare (education, research, health, environment, and so on)? What are the lessons to be learned from crowdfunding models and their limits in thinking about new forms of financing autonomous projects of social cooperation?38 How can we perfect and extend experiments such as that carried out by the Inter-Occupy movement during Hurricane Katrina, in turning social networks into crowdfunding networks that can then be used as logistical infrastructure able to move not only information, but also physical goods?39

SOCIAL NETWORKS

Over the past ten years, digital media have undergone a process of becoming social that has introduced genuine innovation in relation to previous forms of social software (mailing lists, forums, multi-user domains, and so on). If mailing lists, for example, drew on the communication language of send-

ing and receiving, social networking sites and the diffusion of (proprietary) social plug-ins have turned the social relation itself into the content of new computational procedures. When sending and receiving a message, we can say that algorithms operate outside the social relation as such, in the space of the transmission and distribution of messages; but social networking software intervenes directly in the social relation. Indeed, digital technologies and social networking sites "cut into" the social relation itself—that is, they turn it into a discrete object and introduce a new supplementary relation.40 If, along with Gabriel Tarde and Michel Foucault, we understand the social relation as an asymmetrical relation involving at least two poles (one active and the other receptive) and characterized by a certain degree of freedom and potential for reversibility, we can think of actions such as liking and being liked, writing and reading, looking and being looked at, tagging and being tagged, and even buying and selling, as the kind of conducts that transindividuate the social (they induce the passage from the preindividual through the individual to the collective). In social networking sites and social plug-ins, these actions become discrete technical objects (like buttons, comment boxes, and tags), which are then linked to underlying data structures (for example, the social graph) and subjected to the power of algorithmic ranking. This produces the characteristic spatio-temporal modality of digital sociality today: the feed, an algorithmically customized flow of opinions, beliefs, statements, and desires expressed in words, images, sounds, and videos.

Much reviled in contemporary critical theory for their supposedly homogenizing effect, these new technologies of the social, however, also open the possibility of experimenting with many-to-many interaction and thus with the very processes of individuation. Techno-political experiments (see the various internet-based parties such as the Five Star Movement, the Pirate Party, Partido X, and Barcelona en Comú) draw on the powers of these new sociotechnical structures in order to produce massive processes of participation and deliberation; but, as with bitcoin, they also show the far-from-resolved processes that link political subjectivation to algorithmic automation. They can function, however, because they draw on

widely socialized new types of knowledge and crafts (how to construct a profile, how to cultivate a public, how to share and comment, how to make and post photos, videos, notes, GIFs, how to publicize events) and on "soft skills" of expression and relation (humor, argumentation, sparring) that are not implicitly good or bad, but present a series of affordances or degrees of freedom of expression for political action that cannot be left to capitalist monopolies. However, it is not only a matter of using social networks to organize resistance and revolt, but also a question of constructing a social mode of self-(in)formation, which can collect and reorganize existing drives toward autonomous and singular becomings. Given that algorithms, as we have said, cannot be unlinked from wider social assemblages, their materialization within the red stack involves the hijacking of social network technologies away from a mode of consumption whereby social networks can act as a distributed platform for learning about the world, nurturing new competences and skills, fostering planetary connections, and developing new ideas and values.

BIO-HYPERMEDIA

The term bio-hypermedia, coined by Giorgio Griziotti, identifies the ever more intimate relation between bodies and devices that is part of the diffusion of smart phones, tablet computers, and ubiquitous computation. As digital networks shift away from the centrality of the desktop or even laptop toward smaller, portable devices, a new social and technical landscape emerges around "apps" and "clouds," which directly "intervene in how we feel, perceive and understand the world."41 Bratton defines the apps for platforms such as Android and Apple as interfaces or membranes linking individual devices to large databases stored in the cloud (massive data processing and storage centers owned by large corporations).42 This topological continuity has allowed for the diffusion of downloadable apps which increasingly modulate the relationship of bodies and space. Such technologies not only "stick to the skin and respond to the touch" (as Bruce Sterling once put it), but create new "zones" around bodies that now move

through coded spaces overlaid with information, able to locate other bodies and places within interactive, informational visual maps. New spatial ecosystems emerging at the crossing of the "natural' and the "artificial" allow for the activation of a process of chaosmotic co-creation of urban life.[43] Here again we can see how apps are, for capital, simply a means to monetize and accumulate data about the body's movement while subsuming it ever more tightly in networks of consumption and surveillance. However, this subsumption of the mobile body under capital does not necessarily imply that this its subsumption is the only possible use of these new technological affordances. Turning bio-hypermedia into components of the red stack (the mode of reappropriation of fixed capital in the age of the networked techno-social) implies drawing together current experimentation with hardware (from Shenzi phone-hacking technologies to maker movements) able to support a new breed of "imaginary apps" (for example, the apps devised by the artist collective Electronic Disturbance Theater, which are designed to help migrants bypass border controls, or other apps able to track the origin of commodities and their degrees of exploitation).

CONCLUSIONS

This short essay proposes another strategy for the construction of a machinic infrastructure of the common. The basic idea is that information technologies, which comprise algorithms as a central component, do not simply constitute a tool of capital, but are simultaneously constructing new potentialities for post-neoliberal modes of government and postcapitalist modes of production. The possibility of doing this depends on opening possible lines of contamination along with the large movements of programmers, hackers, and makers involved in a process of recoding network architectures and information technologies based on values other than exchange and speculation. It also depends on acknowledging the wider technosocial literacy that has recently affected large swathes of the world population. It is a matter, then, of producing a convergence able to extend the problem of the reprogramming of the in-

ternet away from recent trends toward corporatization and monetization at the expense of users' freedom and control. Linking bio-informational communication to issues such as the production of a money of the commons able to socialize wealth, against current trends toward privatization, accumulation, and concentration, and saying that social networks and diffused communicational competences can also function as means to organize cooperation and produce new knowledges and values. These would seek a new political synthesis that moves us away from the neoliberal paradigm of debt, austerity, and accumulation. This is not a utopia, but a program for the invention of constituent social algorithms of the common.

In addition to the sources cited above and the texts contained in this volume, we offer the following expandable bibliographical toolkit or open desiring biblio-machine. Instructions: pick, choose, and subtract/add to form your own assemblage of self-formation for the purposes of materialization of the red stack:

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1   This essay is the outcome of a research process involving a series of Italian *autoformazione* institutions of post-autonomist inspiration ("free" universities engaged in grassroots organization of public seminars, conferences, workshops, etc.) and anglophone social networks of scholars and researchers engaging with digital media theory and practice officially affiliated with universities, journals, and research centers, but also artists, activists, and precarious knowledge workers. It refers to a workshop that took place in London in January 2014, hosted by the Digital Culture Unit at the Centre for Cultural Studies (Goldsmiths' College, University of London). The workshop was the outcome of a process of reflection and organization that started with the Italian free university collective Uninomade 2.0 in early 2013 and continued across mailing lists and websites such as *Euronomade* (http://www.euronomade.info/), *Effemera, Commonware* (http://www.commonware.org/), *I quaderni di San Precario* (http://quaderni.sanprecario.info/), and others. More than a traditional essay, then, this aims to be a synthetic and hopefully also inventive document that plunges into a distributed social research network, articulating a series of problems, theses, and concerns at the crossing of political theory and research into science, technology, and capitalism. Previous versions of this essay were published on *Euronomade* in 2014 and in *#Accelerate: The Accelerationist Reader*, eds. Robin Mackay, Armen Avanessian (Falmouth: Urbanomic, 2014).

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## It's Probably Time to Start Lighting Things on Fire
## On Geraldine Juárez's *Hello Bitcoin*

Jamie Allen

"The roof, the roof, the roof is
on fire!
We don't need no water
—let the motherfucker burn!
Burn, motherfucker, burn!"
— Rock Master Scott & The
Dynamic Three[1]

This whole "technology" thing is supposed to have started with fire. On the other side of that lovely and violently bourgeois portal of Western scholastic inspiration called "Greek mythology," technology begins with a sensational, flaming cat burglary. The compensatory thieving of that better-brother Prometheus, or what some have read as his hopeful act of cautious hubris, casts the totality of human techniques and technologies as a kind of widespread, feverish pyromania, a perverse pyrophilia even.[2] Techne as the stealing of fire at once creates and explicates the often mythic relation we assign to even our most intimately mundane (smartphones), materially transformative (industrial server farms), and easily understood (the internet running through undersea cables) technologies, always somehow still seeming out of reach and out of control. That is the unfortunate thing about the myth of Prometheus—it immediately and magically bestows upon us wee humans Technology, en masse, as insatiably consumptive, fiery flames and as a transgressive, unearned arrival "from above," out of nothing. In the annihilation of both space and time understood in the story of Prometheus' raid, we recognize the start of a mythic genealogy which culminates in dan-

gerous fantasies that modern industrial techno-capital continues to "productively" and in equitably nurture. If the well-worn Western technological metaphysics of Prometheus' humanitarian heroism distances, obfuscates, and confounds us with its sleight-of-hand magic, perhaps it is time to develop new cautious and attentive incendiary practices. If progressivist technology development perennially gets out of hand, we would do well to imagine that Prometheus' flight left him with a few burns on his.



Prometheus' creeping, larcenous journey to Mount Olympus and back, made as indemnity for worse-brother Epimetheus' mistake, we should re-read as a smoky, smoldering affair that left ample forensic evidence—foot and fingerprints along a contorted and stammering path. Such would be the start of a techno-mythology that could serve to refine, detail, and reconstitute how technologies manually, materially, energetically, and stutteringly come into being. In place of a hyperbolic trajectory, we would write a fiery field-guide; in place of proclamation or manifesto, we would prepare a user's manual of promethean proto-piracy. The boomerang trip to Olympus, reimagined as the wild, weaving passage

of a freshly energized little packet of data bouncing off a firewall somewhere outside of Frankfurt, Germany or northern Virginia, U.S.A.; a neatly bundled fireball, coaxed and coddled all along the way by an in numerable set of IT infrastructures and institutions, protocols and policies, material propensities and human labor. An inspection of the details of Prometheus' transgression would refocus that parable from the centrality of fire, to the things that fuel a fire, giving us much-needed practice in identifying and deciding what such conflagrations we should choose to ignite or extinguish. We live a technological reality and imaginary that continually asserts apocryphal newness, apocalyptic innovation, transcendent novelty, and ex nihilo originality. All this is mostly in support of "making" money, which, as we are all perversely (un)aware, is not really the making of any thing at all. Bringing fire back into proximity with modern technological things fractionates their deep material backward lineage and precipitates their pernicious, polluting, often carcinogenic, forward effects. Current techno-progressivism fuels little else but the furnace of market economies, whereas sincerely technical, constructive, expressive, or sensual resource networks are left relatively un-stoked. A detailed promethean traceroute could go some way toward divesting the white god-men commuting aboard the San Jose-Palo Alto Caltrain of their missionary, salvation fantasies, or their pathological tendency to confuse market value for technological merit and/or historical necessity.[3]

Why is it that we cannot seem to stop regaling ourselves with hyperbolic, mythic tales of technological heroism? Why do we seem blind or somnambulant in the face of pious, American-exceptionalism "logic" that outlines absurd patronages: Prometheus begot Edison begot Jobs begot Zuckerberg? Why do we refuse ourselves man-

ageable, material explanations for all these banal protocols and simple electronic circuits, these digital mediums and communications, etcetera, which arbitrate our experiences with the world? If we appeal to a parochial legend of teleological, technological theft-gift, then it must be recast as a deferential history of burning stuff. In other words, it's probably time to start lighting things on fire.



January 29, 2014 in Berlin was a cold, dark evening. On this night, a Mexican media-maker, artist, and all-around digital-cultural provocateur named Geraldine Juárez walked to the back lot of the Haus der Kulturen der Welt. At the time, this cultural center located in the city park called Tiergarten was playing host to the transmediale Afterglow festival. On this back lot, Juárez lit a wood fire in one of those large, raised satellite-dish-shaped metal fire pits American suburban dads use to keep from ruining their backyard grass. People milled about, drank bottled beer, and smoked hand-rolled cigarettes. On a wooden log in this fire, Juárez placed a small firework sparkler stuck to an SD card. To this SD card, she had earlier transferred a bitcoin wallet containing 9 milibitcoins, or 0.00977616 BTC, rounded to 9mBTC. This would be her second bitcoin burning, the first one having taken place on March 29, 2013 at 5:23pm, somewhere in the woods outside of Stockholm, Sweden. Once the plastic and silicon card burned itself into a plasticky ash, marshmallows were distributed to be toasted by all present. This whole affair, event, performance, reduction, sacrifice, oblitera-

**Geraldine Juárez** is an artist from Mexico City who lives in Gothenburg, Sweden. Her work focuses on understanding the economic conditions under which dominant knowledge infrastructures emerge, and how they are organized, allocated, and distributed as resources and commodities in present time.
A complete artist statement is available upon request and payment in cash of two thousand Swedish kronor, or four thousand Mexican pesos.

## Geraldine Juárez

## Hello Bitcoin

tion, and investigation is some thing Juárez calls *Hello Bitcoin*. It has since been written about on the internet by, among others, the folks at Motherboard (© 2016 Vice Media LLC, a subsidiary of A&E Networks) and by Nigel Dodd, who in 2014 wrote a book called *The Social Life of Money*.[4]
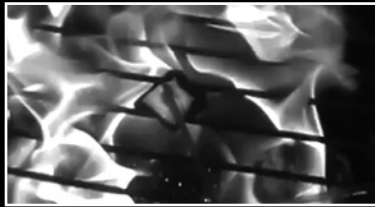


"She's mad, but she's magic.
There's no lie in her fire."
— Charles Bukowski, "An Almost Made Up Poem" (1977)[5]

Geraldine Juárez is one of my favorite people on Earth. This is, in part, because she is an actually disruptive human being. I do not mean this word in the conjectural, regurgitative, and unscrupulous sense in which we use it in reference to technology development these days. There, it seems to describe a process whereby different kinds of computer-supported capitalism cannibalize one another like some kind of depraved, grotesque ouroboros.[6] No, I mean Geraldine is disruptive in the sense that she gets into topics, materials, media, and ideas, messes them up, and then continues to mess them up, without retreat or regret. I mean that she is disruptive in the sense that there are very few situations or systems that one can imagine her participating in without her simultaneously developing an immediate, continuous, and active critique of it, up to and including the implications of her own participation. This she does, as well, as a chronic and energetic participator, collaborator, and activator. Contradictory? Yeah, maybe. But "no-one has ever died of contradictions,"[7] and light-

ing things on fire doesn't only mean you destroy or want to destroy them. It also means that you're interested in the heat they give off, that you're curious to see how they will burn, what they look, feel, taste and smell like while burning, and in what kind of remainder they leave behind once they are consumed by fire. Burning things breaks them down into parts, traces their composition. Solid. Liquid. Gas. Plasma.

*Hello Bitcoin* is "art-as-flame-test."[8] Against the cold night, basking in its warm glow, Geraldine can toast her marshmallows and wait to see who responds to the smoke signals emanating from her little barbeque. What moths will come fluttering to the flames? This is the kind of work Geraldine Juárez does, and she works hard at it. Simultaneous participation and critique, building up and breaking down, generation and destruction, make for undeniably Sisyphean labor, and it's downright exhausting. There are certainly much easier ways to "do art," or whatever else it is we think her work might be or do. I, for one, appreciate that she makes/unmakes it, whatever it is.

Oh, and another reason I like Geraldine is that she's fun, and funny. So, even though she does not share my deep admiration for Rock Master Scott & The Dynamic Three's most famous song (and has told me off for using it in this essay), to the fire inside her and those she lights elsewhere, I nevertheless whisper: "Burn, motherfucker, burn."

"I can't help but dream about a kind of criticism that would try not to judge but bring an œuvre, a book, a sentence, an idea to life; it would light fires [...] It would bear the lightning of possible storms."
— Michel Foucault[9]

Bitcoins, like all technologies and media imbued with imaginary value (a.k.a. "money"), derive at least part

of their worth through the imposition of scarcity. This is achieved for bitcoins through a process known as "halving," wherein every four years a planned, specific number of bitcoins are released in precisely sized blocks. This doesn't go on forever though, and ever since the original code for bitcoin was released by "Satoshi Nakamoto" in 2008, the digital dosh has been capped at a total supply of exactly twenty-one million. In burning, destroying, and eliminating 9mBTC, once in 2013 and then 2014, Geraldine Juárez has single handedly reduced the total number of available bitcoins to 20999999.9804. This physical sacrifice of silicate and plastified matter — taking shape as hot, gooey, molten Secure Digital cards bubbling over glowing wood embers — has technically increased the value of those bitcoins that remain.

In burning up a bit of the blockchain, Geraldine Juárez renders into materiality a number of virtual mythologies, including an "IRC proverb" she herself uses to describe the ambiguous "reality" of bitcoin. "The real aspect making it into a currency is not when it is spent, but when it is burnt."[10] Money burning, not for nothing, has its very own entry on Wikipedia that cites other "value adders" of note, among whom Geraldine now takes her rightful place: Serge Gainsbourg, who burned a 500-franc note in 1984 in a somewhat befuddled protest against taxation, and the members of the KLF, who burned one million British pounds of their own record proceeds in 1994.[11] transmediale's director, Kristoffer Gansing, pointed out to me how such symbolic acts of economic protest are perhaps less linked to *Hello Bitcoin* as are more quotidian, utilitarian acts of money burning done for warmth, or the use of paper money as toilet paper, when its economic value becomes minimal in comparison. Burning bitcoin

directly transduces a marginal amount of currency into a soft, flickering ember for the sincerely communal, all-American family fun of roasting marshmallows.

Bitcoin, of course, derives both real and imagined value from more than just the imposition of scarcity. It is a system of currency inherently interesting to people, desirable to organizations and open to profiteering, because it has been propped up as a new technological object, or system — a state-of-the-art digital thing, and the promise of a less-centralized or centralize-able virtual currency. In Nigel Dodd's genealogy of the monetary, the value of abstracting value emerges as central to fiscal infrastructure and exchange, essential to what allows money to virtually "flow" and achieve analogous "liquidity."[12] This asymptotic tendency in the "science" of economics, away from real things, is fundamental, a pecuniary goal that spans the ages. Money cleaved from its material referents makes for better money. This is, in all likelihood, a common purpose that drives today's often all-too-successful collusion between modes of capital exchange and that other contemporary driver of professed abstraction: computation. Marx wrote of capitalism's addiction to abstract pleasure; wealth accumulation for its own sake both feeds and permeates the bitcoin project and the dreams of its proponents. A bitcoin is digitally abstracted pleasure; a fetish techno-commodity, light on the "commodity"; it is an entrée into pure circulation; the prospect of an in-itself, for-itself, perfectly putative "good." Contrived as new and forged on what might as well have been Mount Olympus by a mysterious and hence unassailable demiurge computer programmer named Nakamoto, at first bitcoin seemed like a god-sent disruptive technology that would scatter the centralized hoards of late-capitalism like cinders against a dark

northern sky. But only a few short months later, operators from "somewhere in China" like BW Pool and AntPool turned Mount Olympus into a massive, makeshift bitcoin mining server-farm facility with full-blown air-conditioning and inline, uninterruptable lithium condensers, musing loudly to themselves in continuously operation.

> "I'll go to hell with a can of gasoline in my hand"
> — (Colonel West) Reza Negarestani, *Cyclonopedia* (2008)[13]

On the internet, people get into mindless deliberations that we sometimes still call "flame wars." A flame war is when two or more people in a discussion get overly malicious and spiteful, and really start in on one another. As a style of discourse, if you can call it that, it's pretty much as bad as it gets, with quick-fire responses veering into hyperbole and fundamentalist claims about things like decentralized virtual currencies: "bitcoin is the future of money"; "bitcoin is a pointless waste of time." The physical flame wars that Juárez has now waged twice (so far) against 9mBTC are, by comparison, a much more constructive affair. *Hello Bitcoin* is an invitation to settle down by a fire and try to hash these things out, as friends with a sense of common responsibility toward one another. *Hello Bitcoin* is a public, convivial flame-test of the messy, confused, and paradoxical promise of novel, "disruptive" technologies like bitcoin, instigated by an actually disruptive human being. As our quintessential cryptocurrency of the moment is cauterized, its siliceous gases rise high into the night, and an act of apparent destruction alchemically transmutes into a moment of respite, and potentially thoughtful, collective discussion. Warmed by fire, as we have been for millennia, people meet and greet one another to speak about hopes for the

future, and the future of technologies "etched in molecular scales disturbed only by atomic noise,"[14] fire, and Geraldine Juárez.



Thanks to Geraldine Juárez for asking me to write this, and to Bernhard Garnicnig and Kristoffer Gansing for their early reviews and comments.

1  Rock Master Scott & The Dynamic Three, "The Roof Is on Fire," Reality D-239, 1984, vinyl 33 1⁄3 rpm.
2  Bruno Latour reframes Prometheus as a slightly less arrogant figure, and writes of the need to "combine the engineering tradition with the precautionary principle; it is as though we [have] to imagine Prometheus stealing fire from heaven in a cautious way!" Latour, "A Cautious Prometheus? A few steps toward a philosophy of design (with special attention to Peter Sloterdijk)," in *Networks of Design: Proceedings of the 2008 Annual International Conference of the Design History Society UK*, eds. Fiona Hackney, Jonathan Glynne, and Viv Minton (Florida: BrownWalker Press, 2009), 3.
3  A traceroute is a diagnostic tool in computer networking that provides a list of servers and transit delays for packet transfers across an internet network.
4  Nigel Dodd, *The Social Life of Money* (Princeton, NJ: Princeton University Press, 2016).
5  Geraldine Juárez was born on July 11, 1977.
6  "I am no longer interested in revolutionary technologies that leave so many people behind. How many people own most of the bitcoins? I think like 40 people." Juárez quoted in "Why Is This Artist Burning Bitcoins?" *Motherboard*, January 27, 2014, motherboard.vice.com/blog/why-is-this-artist-burning-bitcoins (accessed September 23, 2016).
7  Gilles Deleuze and Félix Guattari, *Anti-Oedipus: Capitalism and Schizophrenia*, trans. Robert Hurley (London: Penguin Classics, 2009), 151.
8.  In physical laboratory chemistry, a flame test can be used to visually identify a compound, usually as either mainly metal or salt, depending on what color it turns when it is burned. The intersection of combustion as violent analytic reached a gruesome detent in fifteenth- and sixteenth-century "trial by ordeal" practices, like witch burning. Here innocence was proven via bodily resistance to fire — if you burn up, you're guilty.
9  Michel Foucault, "The Masked Philosopher," in *Ethics: Subjectivity and Truth*, ed. Paul Rainbow (New York: The New Press, 1997), 321–328.
10 As quoted in Dodd, *The Social Life of Money*.
11 "Money Burning," *Wikipedia*, last modified September 21, 2016 http://www.en.wikipedia.org/wiki/Money_burning.
12 Dodd, *The Social Life of Money*.
13 Reza Negarestani, *Cyclonopedia* (Melbourne: re.press, 2008).
14 Donna Haraway, "A Cyborg Manifesto: Science, Technology, and Socialist-Feminism in the Late Twentieth Century," in *The International Handbook of Virtual Learning Environments*, vol. 1, eds. Joel Weiss et al. (Netherlands: Springer, 2006), 120.

## Cornelia Sollfrank

# Revisiting the Future: Cyberfeminism in the Twenty-First Century

> I want the readers to find an "elsewhere" from which to envision a different and less hostile order of relationships among people, animals, technologies, and land [...] I also want to set new terms for the traffic between what we have come to know historically as nature and culture.
> —Donna Haraway[1]

In the 1990s, cyberfeminists conceived a new feminism for the twenty-first century. Inspired by the as-yet-unexplored possibilities of digital networked technologies, enthusiasm spread that the new imaginary realm of zeroes and ones would make discrimination based on physical and material differences obsolete, thus offering new forms of resistance. Instead of embodying white male capitalism, technology was reconceptualized as an accomplice for emancipation.

In this text I will revisit the various elaborations of cyberfeminism that were practiced in the 1990s. Underlying this trip into the past is a series of questions that might help to better understand the present: what were the impulses behind the techno-feminist upheaval?[2] How did the different concepts vary? Can cyberfeminism play a role in the current situation in which the atmosphere of departure has evaporated, making space for a seemingly all-encompassing dystopia? Are there any techno-feminist approaches that respond to contemporary challenges?

TECHNO-FEMINIST INSPIRATION

Despite feminist criticisms about the formation of a canon and historical periodization, it is not possible to revisit cyberfeminism without referencing its originary texts. Donna Haraway's "Cyborg Manifesto," first published in 1985, must be mentioned as a central piece of techno-feminist thinking.[3] Although Haraway herself has never used the term cyberfemi-

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nism, the cyborg metaphor as well as her critique of techno-science have provided important references for the numerous cyberfeminist experiments to come. Considered to be one of the most influential feminist commentators on techno-science, Haraway inspired not only feminist theory, but equally feminist art and activism. Though referring to Haraway does not deny the existence of a variety of other key approaches on gender and technology issues, her fundamental critique seems to be of value for techno-feminist thinking like no other.

It is Haraway's achievement to have significantly contributed to the deconstruction of scientific knowledge as historically patriarchal and of science and technology as closely related to capitalism, militarism, colonialism, and racism. As opposed to liberal feminist efforts demanding equal access, she instead points to the possibilities of a wide-ranging reconceptualization of science and technology for emancipatory purposes. Central to her antiessentialist approach is the critique of "objective knowledge." Rather than understanding science as disembodied truth, Haraway emphasizes its social property, including its potential to create narratives. In her words: "the detached eye of objective science is an ideological fiction, and a powerful one."[4] As Judy Wajcman puts it: "For Haraway, science is culture in an unprecedented sense. Her central concern is to expose the 'god trick,' the dominant view of science as a rational, universal, objective, non-tropic system of knowledge."[5] With that comes the challenging of dichotomous categories such as science/ideology, nature/culture, mind/body, reason/emotion, objectivity/subjectivity, human/machine, and physical/metaphysical on the basis of their inherently hierarchical functions. What is particularly relevant to techno-feminist thinking in this work is that it reveals the construction of the "natural" as a cultural practice.

Haraway's analysis does not lead to an antiscience stance, but rather demands a more comprehensive, stronger, and truer science that includes multiple standpoints. Her concept of "situated knowledge" is a "feminist epistemology that acknowledges its own contingent and located foundations just as it recognizes the contingent and located foundations of other forms of knowledge."[6] With her concept of the cyborg, Haraway goes a

step further and offers a concrete conceptual tool for rethinking feminist-socialist politics in the age of techno-science. The term "cyborg" stands for cybernetic organism, an entity that is neither natural nor mechanical, neither individual nor collective, neither male nor female—an integrated human-machine-system. The cyborg is more than the sum of her parts, and thus, as Karin Harrasser noted, enables new forms of social and political practice by suggesting the artificiality of corpo-reality while exposing the collective nature of subjectivity as well as the inherent politics of inter-connectivity.7 Haraway's cyborg figure symbolizes a non-holistic, non-universalizing vision for feminist strategies and facilitated, amongst other things, an early rethinking of subjectivity under networked conditions.

Instead of resorting to a technophobic utopian model embraced by a number of twentieth-century feminist activist groups in the context of eco-feminism and radical feminism, Haraway argued for the channeling of an inborn agency toward the reinvention of feminist and socialist politics within the paradigms of networking, informatization, miniaturization, and the entanglement of bio- and information politics. The cyborg's subversive potential, however, remained largely unexplored; it seems to have fueled age-old male fantasies of the perfect and controllable female body rather than allowing for non-essentialist subjectivities to emerge.

## EARLY CYBERFEMINISM

Depending on the source, the term cyberfeminism was first used around 1991 by both the English cultural theoretician Sadie Plant and the Australian artist group VNS Matrix, independently from each other. Subsequently, the term was applied in many different, even contradictory ways, which is why it is difficult to assign a coherent theory to it. Nevertheless, it is useful to start with a critical exploration of its early meaning, because in recent historicizations and revivals of cyberfeminism it is usually these early versions that are referred to.

Although applying very different means—cultural theory and art practice—both Plant and VNS Matrix pursued the

same objective: throwing overboard the traditionally technophobic versions of earlier feminisms by propagating an intimate relationship between women and technology. Finally, technology was conceived as sexy for women.

## Planting Optimism

In her 1997 book *Zeroes and Ones*, Plant brings together the past, present, and future of technological developments and interweaves them with suggestive quotes and excerpts from feminist theory and literature, psychoanalysis, philosophy, and cyberpunk material. The methodological medley resembles an essay rather than a scientific work and takes the reader on a learned tour through disciplines and centuries with the sole purpose of collecting evidence for what Plant makes us believe. Not only, she wrote, had a "genderquake" taken place in the 1990s, but also "western cultures were suddenly struck by an extraordinary sense of volatility in all matters sexual: differences, relations, identities, definitions, roles, attributes, means, and ends. All the old expectations, stereotypes, senses of identity and security faced challenges."8 She attributed these massive upheavals, to a large degree, to technological development.

Beyond that, and contrary to popular belief, women significantly contributed to this development, according to Plant. The chain of evidence obviously includes programming pioneers Ada Lovelace and Grace Murray Hopper, but also extends to anonymous spinners and weavers, amazons, witches, goddesses, robots, cyborgs, mutants, and chat bots. Toward this alternate history Plant seeks empowerment in the number zero, which she writes should no longer represent the unthinkable nothingness (of the female) as opposed to the unity of the (male) one. "There is a decided shift in the woman-machine relationship, because there is a shift in the nature of machines. Zeros now have a place, and they displace the phallic order of ones," as Wajcman paraphrases Plant.9 Most importantly, however, it is the decentralized and horizontal structure of the internet itself to which Plant ascribes transformative powers—transitioning us from a male to a female era. "The growth of the Net

has been continuous with the way it works. No central hub or command structure has constructed it, and its emergence has rather been that of a parasite, than an organizing host."[10] According to this view, new technologies not only subvert the male identity; even more exciting is the possibility of inventing endless new identities, thus undermining binary heteronormative subjectivities.

And this is what has survived as the memory of what cyberfeminism was: an excessive belief in the powers of new technologies to transform gender relations due to their inherent properties. Following Wajcman's criticism, what Plant largely ignores are the social and political realities of new technologies. Therefore, in my reading, as in Wacjman's, it is not exaggerated to accuse Plant's version of cyberfeminism of a certain "technological determinism." If the desired change comes automatically with the advent of new technology—at the click of a mouse, so to speak—there is no space and no need for active political engagement. Such celebration of technology must, therefore, be suspected of political conservatism rather than any form of emancipation. Wajcman goes a step further and reveals another problematic aspect in Plant's writing: the inconsistency in the way she uses gender categories. While conceptualizing woman's fragmented and liquefied identities, Plant celebrates "universal" feminine attributes. This leads Wajcman to call her utopian version of the relationship between gender and technology "perversely post-feminist":

> It is a version of radical or cultural feminism dressed up as cyberfeminism and is similarly essentialist. The belief in some inner essence of womanhood as an ahistorical category lies at the very heart of traditional and conservative conceptions of womanhood. What is curious is that Plant holds on to this fixed, unitary version of what it is to be female, while at the same time, arguing that the self is decentred and dispersed.[11]

It is important to revisit Plant's writing almost two decades later. Despite the shortcomings of her theory, her achievement was to enthuse a large crowd. She had her finger on the

pulse of the time and used the premonition of something big to come not only to bring up gender issues, but to ascribe an essential and empowered role to women throughout history. After women having been excluded from technology equally by patriarchal society and feminism for too long, the time was ripe to paint an optimistic picture of female involvement. The promise of freedom and pleasure deriving from an intimate relationship between women and technology was hard to resist. Sobering political analysis that would include in-depth research on how gender, technology, and power are intrinsically sealed together, as well as inevitable fights over political strategies, could wait for later.

## VNS Matrix—The Future Cunt

The Australian artist group VNS Matrix, consisting of Virginia Barratt, Julianne Pierce, Francesca da Rimini, and Josephine Starrs, can claim to have been the first to add feminist fuel to the flaming embers of digital networked technology. Their 1991 "Cyberfeminist Manifesto for the 21st Century" is a wild and poetic expression of their desire to contaminate sterile technology with blood, slime, cunts, and madness and to repurpose technology for anarchic feminist aims.[12]

Tellingly, the manifesto was circulated on billboards—rather than electronic networks—but nevertheless became viral. So did their next project in 1995: the computer game *All New Gen*. The game, which existed only as a prototype and could only be viewed in gallery spaces, nonetheless disrupted stereotyped thinking about gender and technology. The heroines of the game, "cybersluts" and other "anarcho cyber-terrorists," infiltrated the ruling order of phallic power represented by "Big Daddy Mainframe" to disseminate seeds of chaos and confusion and eventually bring down the system. Again, the significance of the intervention did not lie in its advanced use of technology, but rather in its symbolic force, in its powerful poetic language. The imaginary space of electronic networks did have the potential "to stretch imagination and language to the limit; it is a vast library of information, a gossip session,

and a politically charged emotional landscape. In short, a perfect place for feminists," as Beryl Fletcher put it.13

Many ideas originating in the work of VNS Matrix are echoed and extended in Sadie Plant's writings. What they have in common is their speculative techno-determinism that assumes a special connection between the basic features of digital networked technologies and "the female"—that "the new technology cannot be brought back under the old order," as Wajcman has interpreted this attitude.14 However problematic we may find this approach today in terms of feminist politics, these early cyberfeminists had an empowering effect in historical context. In recent years, we could even witness a kind of nostalgic revival of cyberfeminism for which VNS Matrix's ironic visuals and tongue-in-cheek literary outpourings have been particularly attractive. It is important, however, to understand early cyberfeminism as a child of its time. In an online world rife with discriminatory and sexist assaults, as we have it today, fantasies about overcoming the flesh, about overcoming embodied experience by simply dissolving gendered bodies into the realm of their digital representations, seem to miss the point.

CYBERFEMINIST NETWORKING

Numerous theories have been elaborated, and activists and artists have contributed to the diverse field of cyberfeminism that gained great popularity in the mid- and late-1990s.

Old Boys Network

A special occasion to solidify the discourse and build an actual network came along in 1997 when the curators of the Hybrid Workspace at documenta X in Kassel offered me the opportunity to put together one of the ten-day program blocks on the topic of feminism and technology.15 My idea was to use this mega-event as a platform not only for promoting cyberfeminism but also for launching the first international cyberfeminist alliance: the Old Boys Network (OBN).16 The first working group I initiated led to the foundation of the network

in summer 1997 in Berlin. The founding members were artist historian Susanne Ackers, artist Ellen Nonnenmacher, journalist Vali Djordjevic, artist Julianne Pierce, and me. Throughout the five years to follow, OBN constantly changed its shape and internal form. Varying constellations of members managed to actively involve about 180 people in total, at different levels of involvement.17

As our starting point we used the idea of appropriating the term cyberfeminism from its inventors and expanded it to also include aspects beyond identity politics and representation, such as the material and sociological aspects of new digital technologies. Everyone who declared herself a "woman" was invited to contribute. Resetting the meaning of the term cyberfeminism, on the one hand, built on the attention early cyberfeminism had generated, while, on the other hand, opened it up to other, less essentialist interpretations. Thus, cyberfeminism could function as an open projection field in this new context, with the capacity of reflecting manifold individual fantasies, desires, and concepts. OBN turned cyberfeminism into a pluralistic concept inspired by postmodern (feminist) thinking, which put an emphasis on difference rather than unity. As was expressed in OBN's mission statement: "With regard to its contents—the elaborations of "cyberfeminisms"—our aim is the principle of disagreement!"18 In the words of Claudia Reiche, an old boy who joined in during the first Cyberfeminist International: "Operating according to the principle of dissent means that there are no representative statements, no common messages, no coherent forms of expression. The focus is on the differences, the contradictions, the disagreements. And it is through the perception of the thus emerging holes that the stitches of the network become visible—rather than through a laced-up strap." This structure would require us "to conceive a variety of cyberfeminist techniques to be exemplified and assessed in specific approaches."19

In most attempts to write the history of cyberfeminism as well as the recent nostalgia about it, the role of OBN as an organization whose aim was to radically reinvent cyberfeminism by celebrating diversity and multiplicity has been largely

overlooked or misunderstood. Instead of providing a definition and a clear, set political agenda, we asked a question: what is cyberfeminism? Under the motto "Targeting Content: Cyberfeminism," we published an open call and asked for suggestions regarding an expanded approach to cyberfeminism. There were no provisions in terms of format or contents, and we were able to invite thirty participants to join us for the first Cyberfeminist International. The contributions ranged from spatial design, dinner parties, radio shows, artworks, interventions, a dance party, and performances to poetry, philosophy, media theory, and art history. Hosted by one of the most prominent exhibitions for contemporary art, a new generation of cyberfeminists was born in a kind of semi-curated and self-organized mode.

In the euphoric atmosphere of the conference, everyone was able to make a contribution, and, despite the enormous diversity, no confrontations or fights occurred. Instead, the multiplicity that came into the picture was celebrated in a joint manifesto, "The 100 Anti-Theses," of what cyberfeminism was not.[20] This performative rejection of the political need to define our commonalities indicated a new beginning that later has often been misread as lack of political rigor. In fact, it marked a departure, a new era of the discourse on gender and technology, spanning generations, languages, disciplines, cultures, and even incompatible political affiliations.

This could be one possible narrative of the history of OBN: the first Cyberfeminist International as a prelude to the networking activities to come. In the five years of OBN's activities two more international conferences were held, and the conference proceedings with all individual contributions were published online and in print.[21] In addition, OBN made contributions to numerous international festivals, conferences, exhibitions, and publications in the fields of media and performance art, media activism, feminist science, and feminist art criticism. One might assume, therefore, that OBN was mainly a real-life network, and digital networking was merely something that was theorized about. But OBN also experimented with the possibilities the internet offered at the time. Our hybrid self-organized structure—consisting of a self-declared

(changing) core-group and various project groups embedded in a larger network—was organized through its own mailing list, IRC chats, a website, and temporarily even a server of its own, experimenting with new publishing formats as well as live interaction.

NETWORKING—THE MODE IS THE MESSAGE

The name Old Boys Network clearly indicated the form of our organization: the network. Our slogan, "The Mode is the Message—the Code is the Collective," suggested an emphasis on process and an awareness of *how* things were done. In the 1990s, the term "network" resonated with non-hierarchical communication, with distributed relationships that mysteriously interwove to create a tear-proof texture, nevertheless fluid and dynamic, and, if nothing else, with the ability to challenge and undermine rigid and hierarchical power structures. At the same time, it remained a form that was elusive and susceptible to obfuscation, which, in combination with political concerns, could feed suspicions.

Certain formal aspects of our organization, however, were clearly defined and subjected to defined rules. For all public appearances, for example, we had agreed that at least three Old Boys would have to present the network and perform the principles of difference and disagreement by providing three different angles on the same topic. Other aspects of our organization, in particular those regarding the internal structures and the modes of decision-making, remained implicit. It is my contention that the vagueness regarding who and what OBN actually was and how it functioned reinforced a certain opaqueness that eventually added to its popularity.

If and how the Old Boys Network has eventually expanded and exceeded earlier theories and practices of cyberfeminism, however, still requires an in-depth investigation. With our refusal to work on a single general definition of cyberfeminism came the proliferation of many individual approaches, some referring to earlier theories, others writing new theories or inventing new forms of theory and practice. The wide scope of the contributions included, for instance, the inescapable

identity and body politics, as well as issues of representation in cyberspace, but also feminist history, the setting-up of safe spaces such as mailing lists, dinner parties, workshops, digital civil rights, privacy and security issues, free software, immaterial labor, working conditions in the hardware sector, the implications of the military medical complex, hacking as methodology, artistic espionage, artistic uses and abuses of data such as DJing, remixing, and sampling, conflicts over intellectual property, and the realpolitik of gender equality policies in IT industry and games culture. Last but not least, it included the creation of the cyberfeminist network itself.

Working with the Old Boys Network was an overwhelming experience. There was an atmosphere of departure, and we were right in the middle of it. What digital network technologies would bring to the world, how they would change our daily lives and how they would expand our access to information and communication while, at the same time, become the means of unforeseen control and exploitation, was pure speculation at the time. It was certainly exciting to get involved at such an early state.

BEING IN THE WORLD WITH OTHERS

By creating spaces and situations in which diverse approaches could be connected and discussed, OBN provided the stage and the framing context using the proclaimed ambiguity of the term cyberfeminism as a starting point for experimentation. Along these lines, our network could simply be understood as a form of organization, a form of getting organized, or a way to self-organize within or in parallel to traditionally hierarchical systems of academia and the art world. Verena Kuni pointed to this aspect, discussing the emerging opportunities that new technologies offer for "feminist networking" in a male-dominated art world.22 Her deliberations are largely geared toward career opportunities in this context—something that should become one of the central aspects of all gender and technology activities in the context of liberal feminism. The name Old Boys Network actually invites such an understanding. Referring to the informal system of mutual support—typical

within male white elites—it parodies this influential form of invisible power structures without necessarily excluding the aim for a similar form of mutual support. I do not want to deny the relevance of such an approach, although, in my understanding, much more was at stake.

Manuel Castells has suggested the term "networked individualism" for an evolving social pattern that allowed individuals to form "virtual communities, online and offline," on the basis of their interests, values, affinities, and projects.23 This term tries to grasp more than just a way of organizing. It intends to dissolve the old dichotomy between the individual and the collective/community in order to bring about more than just a collection of isolated individuals: a new form of being in the world with others. An essential feature for this cultural shift to happen is, according to Castells, the technological infrastructure on which it is based: the internet. Although, like the techno-determinist claims of Plant and others, Castells' new forms of sociability are directly derived from what is described as an essentially positive technological development, they have opened up a new space for thinking about collective agency.

With his different notion of the "networked individual," Kristóf Nyíri even goes a step further and speaks of a new type of personality emerging in networks: "The network individual is the person reintegrated, after centuries of relative isolation induced by the printing press, into the collective thinking of society—the individual whose mind is manifestly mediated, once again, by the minds of those forming his/her smaller or larger community" (online).24 In contrast to the concepts of networked individualism as elaborated by Castells and others, networking in Nyíri's sense means far more than spawning new forms of sociability; it deeply affects concepts of subjectivity and thus collective agency.

It is not surprising that networks as a site and networking as an activity became popular with feminists. The promises contained in these paradigms met the feminist criticism of the male individual as the origin of subjectivity. It was part of the excitement in and around OBN that we had the opportunity to experiment with such emerging forms—not just in and

through our individual expressions, but also in the way we were connected. Haraway's cyborg had provided the inspiration for this new condition of being in the world as interconnected subjectivities. This is probably the reason why it is so difficult to understand OBN from a present-day perspective. The website is an archive that contains documentation of a lot of our activities, but it can hardly communicate this spirit of being networked. Trying to explore the nature of OBN and assessing its political impact would require thorough social science research that involves more than reading the texts and looking at the pictures published on the website—and more than just one perspective. In any case, the time OBN was operative was a period of collective feminist agency for which we provided the underlying structure.

Together with many other groups and initiatives, OBN belonged to the context of 1990s net culture. In small niches for which the critical confrontation with then-new technologies was characteristic, ideas such as Netzkritik (net criticism), tactical media, net art, and hacktivism were contrived and tested, and together formed a disparate yet networked environment that in no small part was inspired by hacker culture.25

## NEXT STOP AFTER UTOPIA

In the decade after the end of OBN, the notion of "digital culture" as a subculture and domain of experts has shifted to become the general societal condition. Not only do digitally networked media influence essentially all areas of life, the operational logic of networked communication inscribes itself continually and ever more deeply into all aspects of social organization and human experience, which gives rise to endless social science and cultural theory research. What had an ultimately shocking effect within these larger social upheavals were the revelations of Edward Snowden in 2013. Deleuze's notion of the "control society," which has haunted net culture since the early days, eventually pressed its way to the fore, as was made apparent by Snowden.26 It has become hard to deny that the very technology that was reason to dream of new forms of political empowerment has turned out to be

the means of comprehensive corporate and governmental surveillance and control—for everybody. The network and the networked individual, once the embodiments of new forms of resistance, now have become the basis for new forms of exploitation and oppression.

It was Rosi Braidotti who, as early as 1996, spoiled the party when she wrote that the large scale of the digitization of society would mainly lead to an increasing "gender gap": "All the talk of a brand new telematic world masks the ever-increasing polarisation of resources and means, in which women are the main losers. There is strong indication therefore, that the shifting of conventional boundaries between the sexes and the proliferation of all kinds of differences through the new technologies will not be nearly as liberating as the cyber-artists and internet addicts would want us to believe."27 Braidotti's theory was not dismissive of cyberfeminism in general; rather she included materialist and socioeconomic aspects and therefore arrived closer to contemporary reality with her speculation.

A reality check of gender and technology today does not give any reason for optimism. As various overviews and studies have shown, non-whites/non-males/non-heterosexuals are still largely excluded from the creation of the very technology that shapes us and our ways of interacting with the world.28 And self-proclaimed technical undergrounds such as FLOSS (Free Libre Open Source Software), the hacker scene, or hacktivist cultures provide an even more shocking scenario.29

Having arrived in the twenty-first century, one has to ask what has happened to cyberfeminism and other techno-feminist aspirations. It is needless to say that in the light of recent developments, they appear naïve at best. The phallic power of Big Daddy Mainframe not only rules supreme, it is ever expanding. It is my contention that, in order to deal with current challenges from a feminist perspective, it is indispensable to revisit and critically assess 1990s cyberfeminisms in their complexity. We need to understand which aspects were specific to the times they were conceived, and which aspects still have the potential to provide valid references for contemporary thinking. More than ever, there is the need for techno-feminist

theory and practice, and it has to learn from the past instead
of just indulging in nostalgia — or defying it.₃₀

New Dimensions

As Wajcman and other techno-feminist theoreticians have
pointed out, technology is a social construction — a culture in
itself — and therefore can become subject to transformation.₃₁
Technology may be a system that generates power — thus
reinforcing hierarchical categories such as gender, race and
class — but not in a determinist way. "Instead of treating ar-
tefacts as something neutral or value-free, social relations are
materialized in tools and techniques," which allows for the
reverse. Only more inclusive and diverse techno cultures hold
the potential for the transformation of technology.₃₂ This shift
in perspective allows for the social dynamics around technol-
ogy to change and has offered a new space for interventions.

   Critical and gender-aware techno-cultures take this as a
starting point: the creation of diversity by taking into account
the social realities of non-whites/non-males/non-heterosexuals
in the use and development of technology. As elaborated else-
where, intersectional techno-feminist activities exist, but the
field is widely spread.₃₃ Understanding technology as a gen-
dering as well as gendered space asks for destabilizing con-
ventional gender differences through questioning and reshap-
ing technology itself. This is what also has been called a "(re)
politization of the use, design and development of technology
for feminist and social justice purposes" by the organizers of
the TransHackFeminist Event in 2014 in Spain.₃₄ This loose
context, organized through different mailing lists, promotes
and practices various tactics and strategies that range from
queer-trans-feminist hacker spaces to hackathons and crypto
parties, and has also collectively authored an extremely com-
prehensive manual that brings together the expertise of a di-
verse community of activists from around the world.₃₅ The
authors provide detailed technical knowledge, but also stress
the importance of political consciousness raising, collective
action, and solidarity. Core strategies that are discussed and
applied are the formulation and implementation of codes of

conduct for mixed environments, and the establishment of
safe spaces.₃₆ The manual furthermore includes various pri-
vacy and security issues with aspects such as assessing one's
digital traces, creating and managing multiple online identi-
ties, assuring anonymous connections and online communi-
cation, creating tools and platforms for collaboration, safe
handling of data, and advice on how to deal with trolls, all
in order to regain control, at least to a certain degree, over
the technologies we use on a daily basis. Without a doubt,
the practices described in the manual are the essentials of
technical empowerment, but it also becomes clear that the
problems — of gender inequality as well as surveillance and
control — cannot be solved through technical measures alone.
Just as gender equality cannot be forged at the click of the
mouse, as some early techno-feminists envisioned, the use of
crypto-tools will not be the solution for securing mass com-
munication. First, the business models of mass communication
depend to a large degree on collecting private data and will
continue to do so. Second, the use of encryption still requires
expert knowledge that is not easily available for all.₃₇ While
the manual is a great example of techno-feminist knowledge
sharing, the techniques included hardly go beyond the notion
of digital self-defense; it includes some strategies for fighting
back, but it lacks utopian ideas.

Unlike in the 1990s, when cyberfeminism provided a strong
reference term for the diverse techno-feminist approaches of
the time, the field today is more fragmented and confusing. The
above mentioned TransHackFeminist context, for example,
is a largely activist context, active also in the global South.
There are few connections from this activist community to the
art world or to cultural/political theorists, which is why their
rather ambitious and differentiated concerns are not commu-
nicated to a larger audience. Although theoretically inclusive,
the field appears to be confined to a subculture.

   The cyberfeminist succession in the art world is mainly con-
cerned with the representational surfaces of the WWW, social
media, and gaming culture, and avoids tackling the complexities
of gender and technology politics — not to speak of a critical

confrontation with the extremely hierarchical and patriarchal art world. And while the notion of post-gender once was a promising attraction, the signs point toward the fact that old gender stereotypes are being reinforced.38 The cyborg fever is over, and with it are the dreams of transcending the body to become posthuman. What once provoked liberating fantasies about the relationship of technology and subjective sensitivities, about autonomy and heteronomy, has degenerated into a symbol for the assimilation of former counter-cultures by the unholy alliance of capital and techno-science. The state of being "networked" has lost its fascination for the "dividual individuals" of the control society, who instead busy themselves inventing escape strategies.39

The question arises as to what level a new techno-feminist agenda can be conceived that takes into account radical, queer, trans, feminist, and techno activisms, as one example of specific agency, while at the same time making use of the resources and capacities offered by theory and art practice. The Xenofeminist group Laboria Cuboniks, a collective that emerged in 2014, asks exactly for such an emancipatory politics that would connect localized politics of immediacy to scalable theory able to confront abstract global systems of injustice: "Transiting between such scales—between the concrete here and now, and the untouchable, yet *thinkable* abstract—is a requirement for 21st century emancipatory politics, involving an expanded conception of 'specificity', 'particularity' and 'situatedness.'"40 So far, however, Xenofeminism remains "the call for" such a novel theory.

This takes me back to the introductory statement by Donna Haraway quoted at the start of this text, in which she invites her readers to "find an elsewhere," an imagined future from which we can rethink the present. What do we see in our present that we do not like, that we cannot live with, that needs to change? What would it look like in an ideal future society/world? This move to utopian thinking brings us close to fiction and science fiction, a genre that has long been popular with feminists for good reason. Rethinking gender relations is certainly the most important aspect of feminist science fiction, but I believe that contemporary techno-feminist utopias have

to open up and include a rethinking of technology in terms of its dependency on capitalist logic. Questioning gender and technology paradigms cannot take place without seriously questioning capitalist principles of growth and exploitation. This is where techno-feminism has to meet other social movements. Utopia will be there as long as we are searching for it—together. Let's chase away the libertarian ghosts of Silicon Valley who don't know anything but greed and competition. What are "our" images of desire? What are "our" codes for hope? Why not reactivate the cyberfeminist expertise on the future? Only by drafting our visions can we go beyond the contradictions produced within society and get closer to what neither theory nor practice have realized yet. The most important tool for forming an opposition to existing structures will not be the use of advanced crypto-technology, but rather the use of imagination.

*This text is dedicated to my long-standing cyberfeminist fellow combatant and friend Nathalie Magnan, who passed away in October 2016. We will never forget her!*

1   Donna Haraway, "A Manifesto for Cyborgs: Science, Technology and Socialist Feminism in the 1980s," *Socialist Review*, no. 80 (1985).

2   I am using the term "techno-feminism" as an umbrella term for a variety of feminist politics that address—in theory and practice—the coded relationship between gender and technology, and aim at changing this code by opening up the potential of technology to support emancipatory purposes.

3   Haraway, "A Manifesto for Cyborgs."

4   Donna Haraway, *Primate Visions: Gender, Race and Nature in the World of Modern Science* (New York: Routledge, 1989), 13.

5   Judy Wajcman, *TechnoFeminism* (Camebridge: Polity, 2004), 83.

6   Ibid., 86.

7   Karin Harrasser, "Herkünfte und Milieus der Cyborg," in *Die Untoten – Life Sciences & Pulp Fiction* (Hamburg: Kampnagel, 2011).

8   Sadie Plant, *Zeros + Ones* (London: Fourth Estate Limited, 1997), 37.

9   Wajcman, *TechnoFeminism*, 64.

10  Plant, *Zeros + Ones*, 49.

11  Wajcman, *TechnoFeminism*, 73.

12  VNS Matrix, "Cyberfeminist Manifesto for the 21st Century," www.sterneck.net/cyber/vns-matrix /index.php. First version published in 1991 as image on billboard.

13  Beryl Fletcher, "Cyberfiction: A Fictional Journey into Cyberspace—or How I became a Cyberfeminist," in *CyberFeminism: Connectivity, Critique+Creativity*, eds. Susan Hawthorne and Renate Klein, (North Melbourne: Spinifex Press, 1999), 351.

14  Wajcman, *TechnoFeminism*, 65.

15  *Hybrid Workspace*, https://monoskop.org/Hybrid_Workspace (accessed April 26, 2016).

16  The website of OBN is available under www.obn.org and now functions as an archive for most of the material produced by OBN.

17  The text "The Art of Getting Organized" (2013) is a detailed account and analysis of the personnel and structural development of OBN. German only: http://artwarez.org/195.0.html (accessed July 29, 2016).

18  Old Boys Network, "Frequently Asked Questions," http://obn.org/inhalt_index.html (accessed November 11, 2015).

19  Claudia Reiche, *Cyberfeminismus, was soll das heißen?* (Zentrum für interdisziplinäre Geschlechter-studien, 2002), 47. Translation from the German by the author.

20  Old Boys Network, *The 100 Anti-Theses*, http://www.obn.org/cfundef/100antitheses.html (accessed July 29, 2016).

21  Old Boys Network, *OBN Projects*, http://obn.org/inhalt_index.html (accessed August 23, 2016).

22  Verena Kuni, "Ganz automatisch ein Genie? Cyberfeministische Vernetzung und die schöne Kunst, Karriere zu machen," in *Musen, Mythen, Markt*, Jahrbuch VIII, ed. Sigrid Haase (Berlin: Hochschule der Künste Berlin, 2000), 41–50.

23  Manuel Castells, *The Rise of the Network Society* (Oxford: Wiley-Blackwell, 1996).

24  Kristóf Nyíri, "The Networked Mind," in *Studies in East European Thought* 60, nos. 1–2 (2005): 149–58.

25  Although it was part of the critical net cultures' self-understanding to deconstruct technology on the basis of their social and political implications, it was reserved for the "experts" to address gender-related issues. The role of cyberfeminism and other techno-feminisms within these sub-cultures is another issue worth exploring and would make a text in itself.

26  Gilles Deleuze, "Postscript on the Societies of Control," in *October* 59 (1992).

27  Rosi Braidotti, "Cyberfeminism with a Difference," in *New Formations* 29 (1996).

28  Statistical overviews can be found in: Lindsey Gilpin, "The state of women in technology: 15 data points you should know," TechRepublic, 2014, http://www.techrepublic.com/article/the-state-of-women-in-technology-15-data-points-you-should-know/ (accessed September 19, 2016); Emily Peck, "The Stats On Women In Tech Are Actually Getting Worse," *the Huffington Post*, 2015, http://www.huffingtonpost.com/2015/03/27/women-in-tech_n_6955940.html (accessed September 19, 2016).

29  Exact figures are not available for the hacker and hacktivist scene for obvious reasons. In free software development recent overviews show different figures ranging from two percent to eleven percent females in the workforce. See also the Floss survey 2013, http://floss2013.libresoft.es/results.en.html (accessed April 27, 2016).

30  Examples of recent, rather uncritical reviews of cyberfeminism can be found in: Sonja Peteranderl, "Die Pionierinnen des Cyberfeminismus sagen den Tech-Cowboys den Kampf an," Wired Germany, June 2, 2015, https://www.wired.de/collection/life/das-cyberfeminismus-kollektiv-vns-matrix-macht-eine-kampfansage; Claire L. Evans, "We are the Future Cunt: Cyberfeminism in the 90s," Motherboard, 2014, http://motherboard.vice.com/read/we-are-the-future-cunt-cyberfeminism-in-the-90s (accessed September 19, 2016). Others improperly reduce cyberfeminism in an attempt to deny its relevance altogether, such as in Armen Avanessian, *dea ex machina* (Berlin: merve, 2015).

31  Judy Wajcman, "Feminist theories of technology," in *Cambridge Journal of Economics* 34 (2010): 143–52.

32  Ibid., 147.

33  Cornelia Sollfrank, "Gender and Technology Trouble," in *Tactical Media Anthology*, eds. David Garcia and Eric Kluitenberg (Cambridge, MA: MIT Press, forthcoming 2016).

34  Website of the ongoing project: https://transhackfeminist.noblogs.org/ (accessed August 23, 2016).

35  The manual is available in English and Spanish and has been produced and published through Tactical Tech Collective, Berlin, 2015.

36  The concept of "safe space" is elaborated in the GeekFeminismWiki, http://geekfeminism.wikia.com/wiki/Safe_space (accessed August 23, 2016).

37  Dmytri Kleiner elaborates on these interrelations in "Hackers can't solve Surveillance," http://www.dmytri.info/hackers-cant-solve-surveillance/ (accessed August 24, 2016).

38  A good example seems to be the new desire for authenticity as acted out, for instance, by the girls "crying on camera," as written about in: Sara Burke, "Crying on Camera: 'fourth-wave feminism' and the threat of commodification," *UX: Art+Tech*, SFMoMA, May 17, 2016, http://openspace.sfmoma.org/2016/05/crying-on-camera-fourth-wave-feminism-and-the-threat-of-commodification/.

39  Deleuze, "Postscript," 5.

40  Laboria Cuboniks, *Xenofeminism — A Politics for Alienation*, 2014, http://www.laboriacuboniks.net/ (accessed August 23, 2016).

## C. Ecologies

This section is framed as an investigation into the ecologies of infrastructure. The contributors address the ethics of how media materialize and interact—with each other, with humans, and with nonhumans. Given that the notion of media materialism, appropriated from German media theory, has expanded to include questions of global logistics, geophysical changes, and electronic waste, many contributions identify unusual confluences and moments of impact within chains of production and consumption. These provide unique windows into systems that are exceedingly opaque and complex.

According to this geopolitical scope, the problematics of scale come into the foreground throughout this section. As intimate as everyday interactions with media objects can be, they are also the material mechanisms through which the individual enters into contact and conversation with vast systems of power. Reckoning with discrepancies of scale in terms of the personal and the communal, the private and the public, becomes an everyday task. And as the regulation of resources through numerical processes, particularly global finance, becomes increasingly abstract, comprehending the material realm becomes a slippery task. Alongside the importance of technical literacy in this context, the narratives that accompany material processes matter as much as ever. Consciousness is, after all, embedded in ecology, reciprocally defining and being defined by it.

Understanding the way planetary systems work requires multidimensional thinking, and so collaborative and interdisciplinary approaches emerge throughout this section. Leaving normative ideas like the Anthropocene aside, these contributions look to the messy, dispersed ecologies that now characterize life on the planet as existence is reorganized according to exchanges of data, capital, and natural resources. The section is devoted to the efforts of artists, researchers, and activists toward mapping and remodeling these tangled systems, through tactics of imagination and intervention as investigated in the previous two sections.

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**transmediale/conversationpiece** Panic Room Session: Market Uncertainty, Talk, 06.02.2016

# Keller Easterling
# Things That Shouldn't Always Work

**Keller Easterling** is an architect, writer, and professor at Yale University. Her book, *Extrastatecraft: The Power of Infrastructure Space* (Verso, 2014), examines global infrastructure as a medium of polity. Another book, *Subtraction* (Sternberg, 2014), considers building removal, or how to put the development machine into reverse. Other books include: *Enduring Innocence: Global Architecture and its Political Masquerades* (The MIT Press, 2005) and *Organization Space: Landscapes, Highways and Houses in America* (The MIT Press, 1999).

Humans surround the advent of new technologies with stale totems, dreams about newness, transcendence, redemption, supremacy, freedom (in all its politically polarizing liberal, neoliberal, and libertarian forms), decentralization, and the frontier. It was the same for railroads and radio as it is for digital technologies. The names and logos of emergent digital platforms threaten relentless, upbeat, evangelical sharing. Meaning all, everything, or ultimate, Uber hopes to invade and capture market share with an old modern imperative to kill the father and flatten the incumbent. Meaning "people" in Sanskrit, Jana is a crowdsourcing platform that offers free cell phone minutes in exchange for market data collected from billions of people in the world's developing countries—data about "the next middle class" that is sold to companies like Danone and Unilever. The conquest of the market is treated as a principled effort offering gifts that are smart, liberating and "good for everybody." Suggestive of transcendence, Ethereum adopts a Kryptonite logo. It promises to replace centralized finance, social networking, law, and governance with a multitude of currencies and a massive platform for achieving "consensus" through smart contracts on the blockchain. Having discovered the elementary particle, the platform is universal and comprehensive. Math is the perfect language, data is the only information of consequence, and the whole world is Turing-complete. To suggest co-existent logics is to stand in the way of the superior successive logics.

When fitted for this toupée, digital platforms can become like any common organization that oscillates between isomorphic closed loops and binaries of opposition. Organizations routinely strive to be the one and only in a steady state—from the echo chamber of corporate managementese to the self-congratulatory isomorphism of organizations like universities and political parties. And given desires for autonomy or supremacy, that closed loop often protects itself from contradiction with binary opposition—tightening its security or lashing out against the opposing challenge. Ultimately the organization is

saying something different from what it is doing. Whatever the glorious claims and declarations, the organization is decoupled from its disposition—a disposition oscillating between loop and binary that becomes the dominant presence.

When they don't erase their own intelligence, emergent digital technologies can innovate not by claiming false supremacy but by modeling a habit of mind about something other than themselves. A cultural immersion in digital networks potentially makes more palpable the matrix or disposition in organizations—the agency or potentials latent in arrangement. Any organization—like a growth medium or operating system—determines what will live or die, or what makes some things possible and some impossible. That digital immersion then ironically makes it easier to detect the loop and the binary in digital culture that both reject information. And since digital networks have already tutored an understanding of the messy redundancies of resilient organizations, we might consider the singular universal platform that organizes everything to be dumb or information-poor compared to mixtures of information platforms with different photons and lineaments and coexistent contradictory logics. If anything, rather than supremacy, this habit of mind makes the heavy, lumpy world itself more palpable as a mixture of information systems that potentially make each other smarter. It was probably easier to see before a moment of digital ubiquity, but whether or not space is coated with sensors in the Internet of Things, information still resides in the solid material of space. Space "computes."[1] While avoiding cybernetic holism, as Gregory Bateson noted, a man, a tree, and an axe is an information system.[2]

When looking with half-closed eyes at the world—at these mixtures of overlapping information systems—it is clear that spatial information systems graphically model the special forms of violence that attend the oscillation between crude dispositions like the closed loop and the binary. While the violence of binary conflict is familiar, the closed loop generates the less familiar violence of remaining intact. Still often quite grisly, closed-loop casualties are deaths from the elimination or denial of information that appear through gradual attrition or abrupt collapse. The Shenzhen landslides or Rana

Plaza graphically model their deadly effects. One agent of this matrix, the common "free zone," is the quintessential closed loop of corporate externalizing regulated by things like the International Organization for Standardization (ISO)—non-binding standards of consensus or the self-certification that inoculate corporations against more intrusive environmental or labor regulation. The worker cannot be addressed because there is no structure in which the worker can exist as information. The nation, behaving as if its only repertoire is to grant or deny citizenship, cannot resolve the transient being of the worker. So the ensuing default is a binary reaction that often targets or vilifies the worker or migrant as an enemy, while also calling for still more security or a numbing consensus—what Rancière has called "the round-table treatment."[3] The worker, or the migrant who is in a similar situation, is "inadmissible evidence."[4] The loop or the binary are structurally incapable of addressing their problems because they reject or expel the very material of that problem to attain the supposed strength of a dumber consensus.

When an attempted innovation, in digital or other technologies, assumes the organizational disposition of the loop or the binary, we find ourselves banging away with the same blunt tools that are completely inadequate to address contemporary chemistries of power within multiple overlapping sovereignties and ballooning numbers of non-state players. The conclusions of consensus and the declarative instruments like laws, standards, and repeatable formulas are treated as rational when they are often highly irrational, and treated as marks of stability when they are most risky. We stay in the military-economic theater. The binaries of wars and the chest-beating Westphalian sovereignty of nations remain in place as staples of history. *Homo economicus*, who only knows arias about loops and enemies threatening freedom, is allowed to upstage and hold forth. Even dissent, adopting the very same isomorphic or binary dispositions, sometimes knows what's "good for everybody"—existing in a world of enemies and innocents or chalking up its failures to a lack of purity.

And the world's power players and bullies thrive not only on these oscillating dispositions but also on the decoupling of

declaration and disposition itself. They are masters of monistic demagoguery and binary head-on brutality. If their victims tighten the loop in retreat, they absorb the relinquished territory. And if their victims lash out in opposition, they are even more thoroughly nourished by the resulting rancor. But they are also masters of fluid duplicity, multiplicity and discrepancy. al-Qaeda, ISIS, NRA, McCarthy, Putin, and Trump know how to say something different from what they are doing—offering a message discrepant from the disposition of their organizations. Unburdened by truth, running rings around the earnest declaration, the discrepancy that others are futilely trying to reasonably reconcile is the material of fully mediated rumor and contagious fictions that batter the walls and work the back channels with stunning success.

And it all comes with lots of elaborate discrepant stories. There are ISIS pen pals and annual reports. There is lots of "free stuff"—gift bags, stickers, commemorative mugs, upticks, likes, executive take-aways, mandalas, pyramids, check lists, cartoons. There are cloying Gladwellian or TED-talk locutions. Or there are the rainbows, diamonds, and sun flares of hundreds of free-zone promotional videos. As Sianne Ngai helps us see, these stories often operate in the aesthetic regimes of the creepy and the cute.5

DISPOSITION DISCREPANCY INTERPLAY

But still looking with half-closed eyes at the heavy, lumpy world, what if all you could see was disposition? Maybe an altered habit of mind sets aside declarations about comprehensive platforms for sharing or anything else and uses disposition and discrepancy as raw material of another approach toward partial interplay. Wandering out of the military and economic theaters and the swirling stories about universals and freedom, looking for another kind of air or logic or anti-history, that altered habit of mind makes available additional evidence and form-making techniques with different aesthetic pleasures and political capacities.

Within a culture that is well-rehearsed at pointing to things and calling their names, but under-rehearsed at describing

the interactivity or chemistry between things, this infrastructure space becomes productively imponderable. Like digital networks it is it is too large to be in any one place and better assessed with the disposition immanent in organization than with object name, shape, and outline. What if the goal was to detect and counter a much broader array of violent dispositions and a more nuanced array of variables that make organizations information rich or information poor? Not the homeostatic steady state but the presence of irrationality, discrepancy, and imbalance are the instrumental resources of this approach. Not fixed pools of information but rather extrinsic information and contradiction and mixtures of information systems with different lineaments can fuel a variant of sharing—a counterbalancing interplay and reciprocity to disrupt the loop and the binary.

Detecting and designing disposition in infrastructure space benefits from an artistic curiosity about reagents and spatial mixtures or *wiring*—that is, designing not a single object but an updating platform for inflecting populations of objects or setting up relative potentials within them. The dispositions of infrastructure space are manipulated with active forms—undeclared, time-released forms or markers. Active forms are like little bits of code in the spatial operating system—multipliers, switches, governors or other little machines of interplay. And when declaration is treated as the only thing that counts as information, these dispositions can also hide in the air in front of our eyes and decouple from all of the stories we tell about infrastructure. With this discrepancy, they are already tools of political stealth—tools that could be deployed to different ends. With the ability to detect disposition comes the ability to detect violence, even if nothing happens—latent violence without the events that trigger conventional histories.

Even though they are not objects or master plans, disposition and discrepancy are not invisible, unknowable, errant, or magic, they are just another kind of knowledge or practice. With a tip of the hat to Gilbert Ryle, interplay is less about "knowing that" and more about "knowing how." Knowing how requires a comfort with dynamic markers and unfinished processes that are too indeterminate to be practical. One can

only know *how* to navigate a river by observing ripples and dimples on the surface, feel for the potentials of bread in dough, land a plane in high wind, sling plaster, hustle, kiss, or tell a joke.6

With these faders and toggles of infrastructure space, you can begin to feel for multiple points of leverage. You can model spatial protocols that identify linkage, interdependence, reciprocity—limited terms of interplay between spatial variables in explicit but indeterminate processes. Consider the eighteenth-century city of Savannah, Georgia, which was governed by a loose time-released protocol for growth by wards, each of which contained a quotient of public, private, green space, and agricultural space beyond. Even though there were explicit, measured instructions about spatial relationships, the shape of the town's outline was indeterminate. Confidence games probably trump game theory in the world, but consider also the ratchet effect of Parrando's Paradox, a counter-intuitive game theory proposing that playing one losing game results in loss, but alternating between losing games can generate a win. One design does not have to be the single right answer. It only needs to be powerful enough to start a chain reaction.

THINGS THAT SHOULD NOT ALWAYS WORK

How do you shape global agreements not as masterplans, declarations, laws, or standards, but as bargains or ratchets to recondition spaces over time? How do you trade between failed or losing games looking for productive imbalance or leverage? What are the one-to-one relationships that dissolve deadlock? How do you introduce spatial variables to check the economic variables that dominate global governance? How do you rehearse chain reactions that are deliberately partial and need constant tending? They could be productive or go terribly wrong. They could counter concentrations of authority and violence or, if manipulated by power, they could be gamed to render unproductive outcomes. How do you diagram not solutions, but things that *shouldn't* always work—not because they are marginal or weak, but because they are not ultimate or permanent?

Imagine a protocol for subtracting architecture—not only putting the development machine into forward but also into reverse. The protocol would be something like a reverse game of Go. Severe financial failures mean that many cities are no longer trading trafficked mortgage products but actual heavy attributes of land. This protocol would link failed and densifying properties as safeguards against more violent ecologies of destruction so that both might benefit from reaggregated sites. Active forms directing the contraction of development might be very useful in many parts of the world, from distended McMansion suburbs to coastal flood plans to sensitive environmental landscapes. The subtraction protocol might even be a way of countering the destruction of disenfranchised properties through interdependence and exchange so that no property is ever worth nothing.

In flooding coastal areas, property transactions might be considered in groups for complementary attributes and benefits that reduce collective risk. Such transactions might result in, for instance, a net move to high ground, or banks and insurance companies offering lower rates and streamlined deals. The mortgage that has been a multiplier of financial environmental and social disaster might be rated not for virtual financial abstractions, but for environmental properties that offer more tangible risks and rewards.

Or imagine the way in which spatial and digital information systems might make each other more information-rich or more information-poor. If driverless cars become the next privately owned car, and if, they are used instead of public transit, they will create congestion that platooning can't remedy. For all their internal sophistication, they will be quite primitive and dumb. If, on the other hand, they are not individually owned but part of a spatial switching and relay network that allows travelers to upshift and downshift to transportation systems of different capacities, the digital and the spatial information systems would make each other smarter.

In populous countries like Kenya, digital information systems are exploding with new broadband capacities and skyrocketing numbers of cell phones. But spatial information systems are more robust when people access each other and multiply

their exchanges. In Kenya, the spatial vessels that accompany digital technologies are often large highways or zone enclaves that decrease exchanges, inflate the distances between people, or lead to construction of cities with the topology of a closed loop. While roads are typically regarded as conduits of progress and opportunity, in rural or wilderness areas it might be more productive to dial down roads when dialing up broadband to preserve farms and wilderness that attract global resources for tourism or education. Changing a road as well as changing a bit of code can hack a telecommunications network.

Might some forms of interplay even unwind the zone formulas that created Rana Plaza and others like it? One way to manipulate the zone is to use selected incentives rather than exemptions to leverage assets for existing cities rather than exurban enclaves. Some countries have made access to their oil and gas resources contingent on investment other industries—an "offset" or bargain that leveraged sustaining resources.[7] Developing countries might also make better bargains with their assets. And interplay can facilitate the investment in shared resources—assets like transit that benefit the city while delivering workers to businesses. This urban "rewiring" can bring more intelligence and security, return the enterprise and its workers to the protections and regulations of law, and, finally and more directly, return financial benefits to the domestic economy.

There are certainly moments when dissent must stand up and declare opposition. Yet as important as knowing that—knowing what to oppose—is knowing how to oppose it. Infrastructure space changes not because of duels or righteous binary conflicts, but rather because of dispositional, systemic changes like the population effects of active form. There is no transcendent revolution but rather ongoing revolutionizing.

Still staring with half-closed eyes past the one, the loop, and the binary, maybe it is easier to see: an array of Goliaths or giant abuses that don't resolve into a single enemy, many versions of David each with different tricks, contagious agents of change, the brilliance of stupidity, deadlocks hardening and dissolving, last straws, and moments like the one when Welch said to McCarthy, "Have you no sense of decency, sir?" or

when Tony Curtis said, "I am Spartacus." These would be staples of a different history. How might techniques of the savviest or sneakiest dealmakers, bargainers, and even bullies be deployed to manipulate the inevitable irrationality and stealth in the world? Power survives on fluid stories, political agility, and duplicity, but two can play at this game.

This new hustle can look like many of the prevailing, discrepant stories—like "sharing," "giving back," or "giving as good as you have gotten." Rather than intensifying the violence of a binary by killing Goliath, the sneakier David can trick a large thing into amplifying change. One can offer leveraging gifts. One can even appear to give by giving in. Picking one's submissions rather than one's battles—or staging one's submissions—is an almost invisible, uncontroversial means of gaining advantage in the field without drawing attention to a larger strategy. Similarly, interplay can outwit the old scripts of the freedom conundrum with the desire for obligation. The fictions and meaningless distractions that would seem to be a complete evacuation of activist principles can be wildly successful. The indeterminate is both more practical and more politically vigilant when a snaking chain of moves worms into and gradually generates leverage against intractable politics.

1   César Hidalgo, *Why Information Grows: The Evolution of Order, from Atoms to Economies* (New York: Basic Books, 2015).

2   Gregory Bateson, *Steps to an Ecology of Mind* (Chicago: University of Chicago Press, 2000), 21, 272, 315, 381, 462, 472.

3   Jacques Rancière, *On the Shores of Politics* (London: Verso, 1995), 105.

4   Jacques Rancière, *The Politics of Aesthetics* (London: Continuum, 2004), 85.

5   Sianne Ngai, *Our Aesthetic Categories: Zany, Cute, Interesting* (Cambridge, MA: Harvard University Press, 2012), 83.

6   Gilbert Ryle, *The Concept of Mind* (Chicago: University of Chicago Press, 1949), 27–32.

7   See http://www.tec.tawazun.ae. See also Easterling, "Extrastatecraft," *Perspecta* 39, *Re_Urbanism: Transforming Capitals* (2007), 2–16. The author is indebted to Yale Global Fellow Raheela Khan for sharing knowledge of Islamic banking instruments in an interview on December 4, 2013.

Art Hack Day
Electric Current Consumption
Amps
0.6

Number of downvotes on
reddit.com/r/funny
Downvotes
142,386

142,386 Downvotes

0.6 Amps

Increase: 0
Current Value: 0.6
Running average: 0.6

Increase: 0
Current Value: 142,386
Running average: 142,202
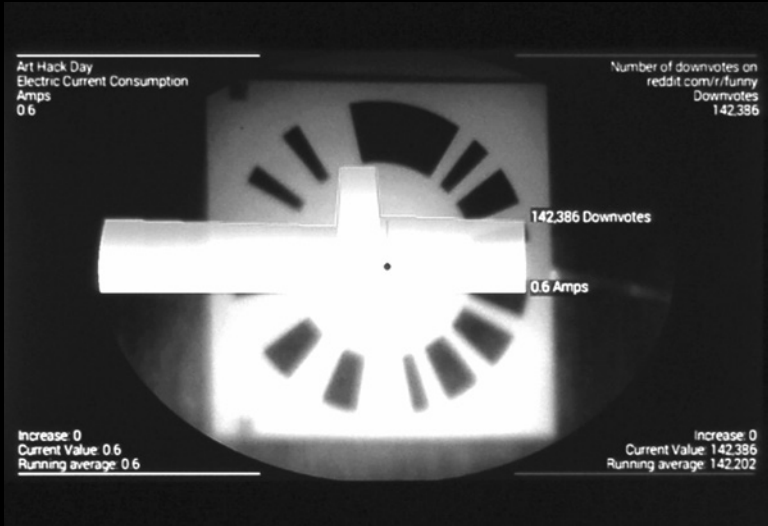
This essay accompanies the *CRITICAL INFRASTRUCTURE* project, an artistic research and production residency by Jamie Allen and David Gauthier that took place as part of the lead-up to the transmediale 2014 festival, afterglow, hosted both by transmediale and the Zentrum für Kunst und Urbanistik (ZKU), Berlin. The project spanned the autumn of 2013, and received the gracious support of the Canada Council of the Arts and the Danish Arts Council .

CRITICAL INFRASTRUCTURE was about uncovering the resources and reserves of physical and material energies, signals, and data that scaffold the very possibility of post-digital art-and-technology practices, including festivals like transmediale. Through a series of public workshops and an installation project situated within the festival, *CRITICAL INFRASTRUCTURE* attempted a media-archaeological and (an)archival site-survey, revealing the data layers beneath the moment(um) of an art and technology festival.

The project turned infrastructure studies into a kind of post-digital institutional critique and reflected the "geological turn" in media practice and theory by installing a large number of custom-built "survey" tripods throughout the transmediale premises. In a world where data mining and circuit-bending are increasingly literal geological and archeological activities, *CRITICAL INFRASTRUCTURE* attempted a survey of the technological landscape of transmediale, its participants, and its community.[2]

**Jamie Allen** is a Canada-born researcher, artist, designer, and teacher interested in what technologies teach us about who we are. He has been an electronics engineer, a polymer chemist, and a designer with the American Museum of Natural History in New York. He lectures, publishes, and exhibits worldwide. He lives in Europe, works on art and technology projects, writes a bit, and tries to engage himself with and create prefigurative institutions. He is Senior Researcher at the Critical Media Lab in Basel, Switzerland.

**David Gauthier** likes to mangle many things, chiefly concepts, objects, disciplines and languages. Born in Québec, he has lived in Montréal, Banff, Cambridge, Copenhagen, and Amsterdam, doing research in puzzling places including the Banff New Media Institute, Hexagram Institute for Research-Creation, MIT Media Lab, Copenhagen Institute of Interaction Design, and the Amsterdam School of Cultural Analysis. David is currently a fellow at the Netherlands Institute of Cultural Analysis where he is researching and practicing errors.

# Jamie Allen & David Gauthier
# Critical Infrastructure

A new poetics giving flesh to a "voice from below," an eloquent voice of the mute. It purported to decipher the signs written on faces, walls, clothes, etc., to travel under the visible stage and disclose the secrets hidden underground.
—Jacques Rancière[3]

With *CRITICAL INFRASTRUCTURE* we speculated on what it might be to look "down," into, and through the sediments of a technological present. We tried to think a course not in terms of eras, generations, and epochs, but through layers, vertical gradients, veneers, and strata—driving the "post-" of post-digitality *into the ground*, not through the ages. In the *afterglow*, the hangover, of the digital booms and busts we have experienced since the late 1980s, there remains the evidence of a very real layering of matter: the dirt and dusts of the digital systems, interconnections, and protocols that feed from and wrap the Earth. What *matters* (that is, presents itself through its material agency) is technical trash, overfilled (an)archives, dendritic digital distensions, and leaky lead-acid coffers—the bursting at the seams of attentional and intentional gutters. These gutters of dirt and dust pass to a kind of "geological thinking," pointing to discussions of the Anthropocene and taking stock of how the technological activities that make us human have come to dominate localities and landscapes, modulating climates and environments. Human contributions to the geological record over the course

of this era will primarily show the effects of technical media: the electrification, then wiring, then wirelessing, of the globe; the development of more complex and complicated means for turning archives of cosmic energies into archives of digital files and documents; the transduction of petrochemistry into electromagnetic radiation. Consider how the modern engineering concepts of backward-compatibility and FIFO (First In, First Out) memory management, respectively, resonate with proto-geoscientist Nicolas Steno's seventeenth-century stratigraphic laws of superposition and cross-cutting: "At the time when the lower stratum was being formed, none of the upper strata existed," and, "if a body or discontinuity cuts across a stratum, it must have formed after that stratum."[4] *CRITICAL INFRASTRUCTURE*, a project of methodological and conceptual misappropriations, extends the work of geological and archeological media thinking. How might we perform a core-drill of media and its technical systems?

Infrastructure is not a substrate which carries information on it, or in it, in a kind of mind-body dichotomy. The discontinuities are not between system and person, or technology and organisation, but rather between contexts.
—Susan Leigh Star and Karen Ruhleder[5]

Gone is the art-and-technology of the "new media artist" that aimed at some terrifically preposterous future of art or media. Technical media is

**Environments are not passive wrappings, but are, rather, active processes which are invisible. The groundrules, pervasive structure, and over-all patterns of environments elude easy perception.**
**—Marshall McLuhan[i]**

composed of embarrassingly simple and commonplace repeated elements (the micro-switching of a wireless router, the ordinary hand-to-mouse gestures of a film editor). The exciting exhilaration of "Where do you want to go today?"[6] The depth of the problems created and solved with technical media might require an engagement that is unseductive, respectful, humble —even boring. Contemporary creative practices express a renewed resonance and interest in these purportedly boring things. Online culture and art-making that we identify as post-digital overflow is concerned with the mundane object, the muted image, and simple interactions. For example, load up a couple of Tumblrs: "Things Fitting Perfectly Into Other Things," or "The Jogging," with its particular brand of Duchampian maneuvering.[7]

There is a half-serious post-digital counterstrike known as The Society for People Interested in the Study of Boring Things. One of the society's charter members, Susan Leigh Star, has described its activities, characteristically, as a list of things:

Among the boring topics presenters brought to the table were: the inscription of gender in unemployment forms used by the city government in Hamburg, Germany; the difficulties of measuring urine output in a post-surgical ward in the Netherlands, and how to design better cups for metrication; the company mascot and the slogans used by a large Midwestern insurance firm in its attempts to build "corporate cultures"; and […] how nematologists use computers to keep track of their worm specimens […]. [What] they have in common is a concern with infrastructure, the invisible glue that binds disciplines together, within and across their boundaries.[8]

What would an art-and-technology of these "punctualized building blocks,"[9] these condensation points for the misty haze of technology as it ascends forever into a—or the—cloud, look like? An attention to infrastructure in artistic work can point out the links between institutional, economic, and political structures, and commonplace and material systems. These "always-on" systems allow for, and (to a lesser degree) are allowed by art-and-technology practices. These banal systems are what we are not supposed to care about, not supposed to notice, while awestruck and immersed, blown away by the spectacle, the narrative, the aesthetic. What lies beneath? "You wouldn't be interested." At least until something has gone, often terribly, wrong. When something works—really works—it *is* infrastructure; just as Douglas Adams puts it: "Technology […] is 'stuff that doesn't work yet'"[10] There are a number of ways and reasons that these things disappear, or are made to disappear, and far too many are motivated by the worrying Realpolitik of knowledge and access, and by the techno-social relations incumbent upon capitalism. There is a particular system of exchange wherein tensions between impressions and realities, the politics of knowledge, at individual and community scales, become highly pronounced. Bureaucracies and institutions express a set of techniques that are also present in the design and development of technical infrastructure: abstraction, compartmentalization, classification, oblivious interiorities, optimization—the list of tendentious strategies spins round and round, centrifuging imbalances of both knowledge and power.

More interesting than visibility through breakdowns are instances where infrastructural performers and human actors do an explicit double-act. A favorite story regarding such a vaudevillian ploy involves one Harvey

"What a useful thing a pocket-map is!" I remarked.
"That's another thing we've learned from your Nation," said Mein Herr, "map-making. But we've carried it much further than you. What do you consider the largest map that would be really useful?"
"About six inches to the mile."
"Only six inches!" exclaimed Mein Herr. "We very soon got to six yards to the mile. Then we tried a hundred yards to the mile. And then came the grandest idea of all! We actually made a map of the country, on the scale of a mile to the mile!"
"Have you used it much?" I enquired.
"It has never been spread out, yet," said Mein Herr: "the farmers objected: they said it would cover the whole country, and shut out the sunlight! So we now use the country itself, as its own map, and I assure you it does nearly as well. Now let me ask you another question. What is the smallest world you would care to inhabit?"
—Lewis Carroll[ii]

Schultz of New York City. During a press conference in advance of the 1987 National Football League Super Bowl game, Schultz hinted to the public at large that it might be a good idea for football fans to "stagger their bathroom visits" during the game —so as to avoid a potentially hydraulically catastrophic "Super Flush." The exacting news outlets of the moment took the story and ran with it. Hearsay about the Super Flush is an important mechanism for unveiling infrastructure in the minds of we who use it unwittingly. The important thing about Schultz's peculiarly artful institutional critique that day at the press conference is not whether or not what he said was true (it was not), but that it made present, perhaps for the first time, that New Yorkers have toilets: they are each part of a massively interconnected system, all connected to an otherwise unnoticeable aqueduct. Schultz did no less than render the infrastructure of plumbing and sewage visible in the consciousness of millions of people.
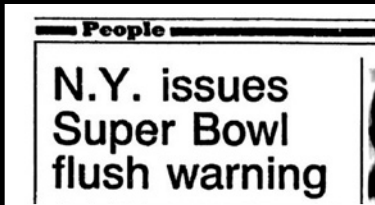


The Tri-City Herald article from January 25, 1987, reporting on the possibility of a "Super Flush" occurring due to toilet activity during the Super Bowl football game. Harvey Schultz, then New York City's Commissioner of Environmental Protection, urged "Don't rush —and think before you flush."

The performance of infrastructures, as making present unwitting, unwanted, or unthought-of systems, has its place and prelude in artist practice. The methods developed by artists and activist associated with forms of Institutional Critique treat the institutional infrastructures of art as fodder for artworks that expose and elaborate them. Institutional Critique serves

as a perforative and performative interrogation into the value and support structures of the museum, gallery, catalogue, and official welcome. For instance, among artist Andrea Fraser's wellknown works is *Museum Highlights: A Gallery Talk* (1989). The scripted dialogue in these interventions includes not only an exposition of art historical and aesthetic concerns, but also discussions of material infrastructure (water, electrical lighting), museum sponsorship, and cultural-economic and political agendas more widely: "Jane walks into the Coat Room, gesturing toward the drinking fountain at the far end. Addressing the drinking fountain: Hmm, 'a work of astonishing economy and monumentality' […] 'it boldly contrasts with the severe and highly stylized productions of this form.'"[11] One thing that makes the work interesting is that it may not matter if what Fraser is saying is wholly accurate or factual. A narrated dataset of factoids and excerpts, the work presents an appropriately incoherent and unlocatable constellation of information and messaging (some lifted from official museum publications), which the audience is left to interpolate between and within. This is infrastructural theater of the super-organism of the art museum and the art world, all strings attached. But in the post-digital landscape, what could be potent for enlivening and reinvigorating this kind of theater? What could serve as a further "new departure point for what used to be called institutional critique"?[12]



Abb2. Andrea Fraser, as Jane Castleton, highlights the water fountain as part of *Museum Highlights: A Gallery Tour at the Museum of Philadelphia, 1989.*

*CRITICAL INFRASTRUCTURE* —that is, technological materials that are at once constitutive of social and political meaning, while reflexively analytic and self-destructive—allow art and technology practices to move "Towards a New Critique of Institutions," as Brian Holmes suggests, through extra-disciplinary, or perhaps anti-disciplinary, approaches.[13] A critical infrastructural study (as artwork, as whatever) might appropriate from the gray media of engineering, instrumentation, and technical disciplines, creating less of an artistic gesture and more of an articulation of live research. How "raw" can the "data" of an "art world" be, and how might it be performed for its artists and audiences? How might such infrastructural data be presented in public, such that we are prompted or called to draw an appropriate panoply of individual, evolving conclusions? There are no truths to be evoked, but relationships and resonances can be modeled and estimated, meanings evoked, tendencies charted, charts traversed; these are further attempts at living in a world we seek to understand. These are extra-disciplinary methods and strategies. Such a reassessment of the post-digital technological landscape seems

necessary: an infrastructural account of the heaving, bristling detritus the digital has left in its wake.

1 Marshall McLuhan and Quentin Fiore, *The Medium Is the Massage* (London: Penguin, 2008), 68.
2 "CRITICAL INFRASTRUCTURE," http://criticalinfrastructure.cc (accessed August 29, 2016).
1 Marshall McLuhan and Quentin Fiore, *The Medium Is the Massage* (London: Penguin, 2008), 68.
2 "CRITICAL INFRASTRUCTURE," criticalinfrastructure.cc, http://criticalinfrastructure.cc (accessed August 29, 2016).
3 Jacques Rancière, "From Politics to Aesthetics?" *Paragraph* 28, no. 1 (March 1, 2005): 17–8.
4 Michael E. Brookfield, *Principles of Stratigraphy* (New York: John Wiley & Sons, 2008), 143.
5 Susan Leigh Star and Karen Ruhleder, "Steps Toward an Ecology of Infrastructure: Design and Access for Large Information Spaces," *Information Systems Research* 7, no. 1 (1996): 114.
6 "Where do you want to go today?" *Wikipedia*, last modified on May 15, 2016 (23:46), https://en.wikipedia.org/wiki/Where_do_you_want_to_go_today.
7 "Things Fitting Perfectly Into Other Things," tumblr, http://thingsfittingperfectlyintothings.tumblr.com (accessed August 29, 2016); "The Jogging," tumblr, http://thejogging.tumblr.com (accessed August 29, 2016).
8 Susan Leigh Star, "Infrastructure and ethnographic practice: Working on the fringes," *Scandinavian Journal of Information Systems* 14, no. 2 (2002): 108.
9 Garnet Hertz and Jussi Parikka, "Zombie Media: Circuit Bending Media Archaeology into an Art Method," *Leonardo* 45, no. 5 (2012): 428.
10 Douglas Adams, "DNA/How to Stop Worrying and Learn to Love the Internet," douglasadams.com, http://ww.douglasadams.com/dna/19990901-00-a.html (accessed August 29, 2016).
11 Andrea Fraser, "Museum Highlights: A Gallery Talk," *October* 57 (1991): 120.
12 Brian Holmes, "Extradisciplinary Investigations: Towards a New Critique of Institutions," in *Art and Contemporary Critical Practice: Reinventing Institutional Critique*, eds. Gerald Raunig et al. (London: Mayfly, 2009), 55.
13 Holmes, "Extradisciplinary Investigations," 53–61.

**In each apparatus, there is a hidden decision. The Good Cyberneticists from the CNRSIO spin it this way: "The apparatus can be defined as the realization of an intention through the implementation of planned environments."**
**—Tiqqun[iii]**

i  Marshall McLuhan and Quentin Fiore, *The Medium Is the Massage* (London: Penguin, 2008), 68.
ii  Joint Chiefs of Staff, "Joint Publication 3–28: Defense Support of Civil Authorities," U.S. Department of Defense, 31 July 2013: IV–3.
iii  Tiqqun, *This Is Not a Program*, trans. Joshua David Jordan (Cambridge, MA: MIT Press/Semiotext(e), 2011), 154.

# Clemens Apprich and Ned Rossiter
# Sovereign Media, Critical Infrastructures, and Political Subjectivity

We are now in an age of near total disorientation at a time when, paradoxically, logistical media of coordination and control are ever more dominant as political and economic architectures. How can we collectively design critical infrastructures when confronted by algorithmic power and data economies? If we are not to submit to a politics defined by individualized acts of withdrawal into the pure narcissism of selfie-production on a mass scale, then what sort of political potential can be generated from sovereign media of indifference? The injunction to participate in networked social life is accompanied by an amplification of absence as communication infrastructures move increasingly into the background. As much as ubiquitous media create a condition of always-on, our knowledge of hardware operations, infrastructural systems, and software protocols has become only more obscured by economies of enclosure coupled with technological complexity. Where you once might have needed to know how to change a gearbox in a car, and could work out how to do such a job if required, nowadays you stand little chance of interfering with service economies designed to partition knowledge of digital systems.

Our interest in this essay is to consider how infrastructures of communication operate as a form of sovereign media, bringing the singularity of the state as a sovereign entity into question. Silicon Valley's exclusive authority to decide on our social-technical futures cannot be so readily assumed when critical infrastructures are activated beyond state anxieties and commercial preoccupations. As we will discuss, the rise of distributed knowledge infrastructures in the form of collective online and offline libraries register critical infrastructures as a social-political undertaking with the capacity to facilitate a politics of autonomy.

## THERE IS NO BLACK BOX

Even with the monopoly effect of "platform capitalism" dressed up as a sharing economy (Facebook, Instagram, Twitter, and

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Uber, and their Chinese variants Renren, 17, Sina Weibo, and 滴滴/didi), the ongoing fragmentation of the interface and the mediation of relations is accompanied by the takeover effect, whereby smaller tech companies are absorbed into the portfolios of stronger firms.[1] So what might a study of standards and standardization reveal about contemporary tech-power in which media territoriality is defined by invisible infrastructures, corporate takeovers, and interface fragmentation, but also by infrastructural integration? Opening up the "black box" of digital cultures is relevant not only from a media technological standpoint, but also from that of politics, economics, and culture. It is only when these forces, dimensions, and practices are brought together that we can explain why a technological infrastructure such as the internet prevails against other infrastructural systems. Why has the Californian idea of a network based on TCP/IP, and not any other network protocol, developed as a global standard and worldwide mass medium within just a few years?

We need not be obstructed by the infrastructural black box of the "network of networks" or "web of webs," which so often reduces descriptions of network media in ways indistinguishable from any other network—the postal system, for example. But we can glean a sharper analytical architecture by attending to the empirical properties of digital infrastructures that organize and extract value from the routines of labor and life. This means that media technologies cannot be understood without the norms, values, and desires that accompany them, since these ultimately find expression in the way networks are conceived and in the way development processes are designed as they emerge in the form of digital infrastructures.[2]

Instead of relying on large-scale sociological studies, where technological developments are explained by means of social discourses, or a media-materialistic predilection that assigns the technical a transcendental quality that determines social discourses, we instead see infrastructures as actual mediators, which have always themselves been mediated. Here it is less the case of "a difference which makes a difference," as Gregory Bateson put it, so much as infrastructure, which determines and—crucially—limits the horizon of power precisely be-

cause of the complex of sociopolitical forces that refuse the logic of submission.₃ Once infrastructure is unhinged from control through willful acts of unruliness—to say nothing of the unsettling intervention of contingency (technical break-downs, labor disputes, economic crisis, environmental catastrophe, etc.)—the capacity to ascribe variable propensities to infrastructural systems conditions the possibility of new political cosmologies and territorial configurations.₄ The act of infrastructural invention that takes hostage the precious R&D that feeds into technologies of control instantiates the autonomy of sovereign media.

## SOVEREIGN MEDIA

Sovereign media are apparatuses of indifference.₅ They are a negative media of subtraction. "Unlike the antimedia, which are based on a radical critique of capitalist (art) production, sovereign media have alienated themselves from the entire business of politics and the art scene."₆ Sovereign media are not consciousness-raising machines. They hold no megaphones. Inherent to media of ubiquity, the dull surfaces of sovereign media are ideal hosts for practices of anonymity, obfuscation, and opacity. They involve a game of tinkering with the parameters of the given. They operate within formats of familiarity and flourish when systems short-circuit. Sovereign media are primed to exploit the infrastructural ruins of a logistical future. Sovereign media are not a return to the politics of exodus, but a way to scale autonomy beyond tactical media as demonstrated by WikiLeaks, among others. Part of such work involves unleashing alternative blueprints, prototypes, and test cases for a future that includes reformatting the world after an orgy of capital accumulation and exploitation.

Sovereign media absolve the injunction to participate. Not capable of interpellating subjects into the spectacle of mass media, nor reducible to the aggregation and recombination of data sets, sovereign media emerge from the fatigue to respond. They restore the '90s net-cultural promise of producing your own media as the material basis of collective organization, yet have to do so in a post-Snowden environment of secrecy.₇

Surveying the rash of tech-speak and plumbing the morass of managerial discourse within universities and across the corporate sector today, one could be forgiven for thinking the '90s never ended. But the '90s were not such a lost decade. The long summer of internet euphoria that culminated in the tech-wreck of 2000–02 also spawned numerous experiments in media collectives, hacker labs, and new grammars of expression.

## TERMINATING PARTICIPATION

The advent of digital media over the past twenty years has instilled across populations and cultures a new desire for connectivity and participation. Part of this stems from the technical properties of digital media, with tech-boosters, commentators, academics, government, and business all providing the discursive layer to encourage the society of connection and economies of modulation. The surplus of data produced by networked societies prompts us to revisit practices of political participation. Processes of social negotiation become inseparable from media apparatuses, data economies, and platform politics. The enormous volume of data generated by our compulsion or command to participate is tied to the social production of value.₈ The algorithmic mining of data has become one of the last frontiers of economic extraction.₉ In a world in which every post, comment, or act of enunciation produces its own milieu of data-subjectivity-expression, the resulting collapse of "symbolic efficiency" achieved by the scale of the signal and circumscription of the message further erodes the cohesion assumed of imaginaries common to the citizen-subject, mass media, and the nation-state.₁₀ This is not something we need lament, but rather note as a prevailing sociotechnical condition.

Template cultures have become today's iron cage of reason. They are an unknown default whose genealogy is not without power in placing limits on expression in seemingly invisible ways. Speculation is no longer the work of imagination but rather is consigned to the operation of machines and the default settings of parameters. We need to collectively orchestrate

strategies of infiltrating existing systems and manipulating them for other ends from within. This is not about submitting to the state or any other sovereign entity in the interest of reform. Instead, such a move consists of identifying prevailing black box systems of control and collectively devising ways to exploit these apparatuses. Whether this is a world beholden to the rise of a neo-technocratic class in charge of engineering the protocols of platforms remains to be seen. At the very least, we can design new idioms of practice beyond the template culture that services our expression.

## EXPROPRIATING CRITICAL INFRASTRUCTURES

Responding to an announcement that the Singaporean government plans to shift 100,000 computers offline following a hack of its websites by Anonymous in 2013, Florian Cramer observes that, "Not only is offline the new luxury, it also becomes a new necessity for critical infrastructures."[11] What sort of critical infrastructures can we identify and engage that are external to the purview of the security apparatus of the state and the governance of risk? How do we imagine political action within contemporary digital media networks? And how can we create and sustain alternative social infrastructures to serve the often mutually conflicting agendas of socialities instituted by infrastructures of communication?

Infrastructures are critical because they are always already in crisis, and therefore open to détournements and misappropriation. At the same time, infrastructures are critical because they yield critical knowledge and foster a diversity of art and media practices in domains of labor and life not yet completely expropriated by processes of capital accumulation. "Critical infrastructures" work as an analytical concept that scrutinizes current media practices and materialities of network technologies. As such, they provide a theoretical framework that enables us to analyze critical network infrastructures as new forms of sovereign power not reducible to the command of the state or economic interests of corporate entities (not that these distinctions are by any means so neat and more often overlap). Making infrastructure "critical" and central to in-

quiry, therefore, yields strategic knowledge about the social-technical architectures, practices, and processes that underlie digital phenomena.[12]

## POST-DIGITAL CONDITIONS

The recent debate around the "post-digital" has taken up the thread of scrutinizing the historical as well as material contexts of digital culture. In contrast to the solutionist faith in digital progress, post-digitality describes a condition which is characterized by digitization as a way of life as a whole, thereby cutting across the boundaries between old and new, analog and digital, real and virtual.[13] And in accordance with Lyotard's definition of post-modernism, the "post" in post-digital certainly does not imply that we live "after" the digital. Rather than a temporal sequence, the term points to a critical reassessment of those values and practices that have made digital media and its infrastructures part of everyday culture. It is not by chance that the current debate about the post-digital world arrived on the scene when faith in digital technologies was broken. With the revelations of Edward Snowden, the phase of digital techno-euphoria that persisted after the dot-com crash as web 2.0 and its associated monikers has been revised.

Post-Snowden, one senses a much broader general suspicion, if not informed critique, of digital communication infrastructures as technologies of capture, which distinguish themselves through their insignificance rather than their unique selling proposition. In fact, it is the indifferent infrastructure, the one we have been surrounded by for ages without noticing, that constitutes the backbone of digital cultures. No matter how much the nineties libertarian dreams of internet freedom have turned into farce, we do not yet need to surrender the possibility of inventing social infrastructures that enable the collective production of knowledge, and in doing so imagine new political subjectivities. Such a desire is clearly invoked by Marcell Mars, Manar Zarroug, and Tomislav Medak in their manifesto on the public library: "Today nobody lacks the imagination necessary to see public libraries as part of a

global infrastructure of universal access to knowledge for literally every member of society."[14] Whether we buy into the dictum of access for all is less relevant than the observation here that infrastructures are not limited to the materiality of media but are also integrated with the power of the imaginary.

## POLITICAL SUBJECTIVITY WITHOUT A PUBLIC

How can we conceive agents of knowledge that are not reducible to the abstract universality of the public as a social body constitutively tied to the state? How, in other words, to decouple the public from the state? This is the uninterrogated challenge presented to us by various curatorial and collectively produced projects that seek to reclaim knowledge resources not captured by commercial publishers and techno-regimes of enclosure. All too often a moral imperative lurks within what the commercial world and legal organs of the state attribute as instances of pirate infrastructure. Online "shadow libraries" such as Library Genesis, aaaaarg.fail, Monoskop, Public Library, Memory of the World, and Ubuweb have a general mission to return knowledge resources to a commons not circumscribed by the gated enclaves of university libraries or commercial publishers, whose profits are made possible to a considerable extent by publicly funded research. These various digital libraries also aim to disrupt platform monopolies such as Google and Amazon by inventing knowledge resources as social infrastructures liberated from the political economy and monopoly tendencies of intellectual property regimes.[15]

For all the wonderful intentions and practical reality of making the labor of knowledge an accessible resource, the specter of "the public" persists as a motivating subject upon whom knowledge should be bestowed as a moral right. Such an ontological and political framework is underscored by an anxiety around access. There is an embarrassing delusion that haunts claims, ambitions, and desires of making knowledge available to "the public." The primary audiences of many of these inspiring projects are, when it comes down to it, within the intellectual and artistic vanguard (with the scale of LibGen and Science Hub standing as exceptions that address a broad

spectrum of disciplines and scholars). How, then, to conceive a political imagination designed not around a reconstitution of the liberal subject inherent in appeals to the public, but rather a subjectivity that emerges from the collective production of infrastructure and knowledge that is underlined by an anticipatory politics in a world gone to ruin? Don't get us wrong. We are not invoking a melancholy aesthetics of repair that yearns for freedom without the spoils of catastrophe. Rather, we ask how subjectivity foments within political struggles and infrastructural politics related to knowledge production.

The critical infrastructure agendas of the state-corporate nexus are focused pretty much exclusively on identifying political, economic, and military assets in need of protection against unforeseen terrorist threat or environmental disaster. The consideration of public infrastructures long ago disappeared from the horizon of concern within this orbit of power. Thus appeals by digital library projects to the public are salvage operations underscored by a category misrecognition of sociality produced within digital infrastructures whose social-technical operations hold an asymmetrical relationship to the state. How, in other words, to think of sociality beyond the state yet immanent to digital infrastructures of communication and knowledge production? There is some correspondence here with what Paolo Virno conceives in terms of a "non-state public sphere."[16] While Virno's appeal to the publicness of language and thought—or "republic without a state"—institutes the virtuosity of the general intellect and the political ontology of the multitude, all too often contemporary invocations of the public are considerably more blunt and even submissive in their political imagination. The more widely accepted sense of the public readily assumes a primacy of expression predicated on deliberation and rational consensus.[17] The examples we pursue below follow a different contour that precipitates a concept of political subjectivity from the operational logic of digital infrastructures.

## RECYCLING INFRASTRUCTURES

Rethinking the politics of digital infrastructures does not only necessitate the aforementioned critique of the liberal subject

and its publics, but also consists of perspectives that break with this geo-cultural paradigm more peculiar to modern liberal democratic systems of governance. Do-It-Yourself projects, art, and media critique in Latin America, for example, register alternative modes of knowledge production in order to rethink dominant assumptions about how politics, economics, and culture are reassembled by digital networks, while also opening new approaches to the invention of infrastructures. A critical perspective emanating from infrastructural experiments in Brazilian net culture has generated novel expressions of what it means to collectively design and produce digital infrastructures. We might turn to these kinds of examples in order to reassess the potentialities of infrastructures for activism and art production aimed at galvanizing social transformation. While the politics of infrastructures often come along with—or are even conditioned by—processes of concentration, centralization, and accumulation, they are, at the same time, complicated, vulnerable, and amenable to modification through interference.

Since 2002, the use of recycled computers has provided the infrastructure for artistic interventions and collective reappropriation of technology to facilitate new social possibilities in mainly rural parts of Brazil. The situation at the time between government and subnational techno-cultural collectives and social groups was quite unique. In the early 2000s, the Ministry of Culture was developing digital inclusion and cultural economy policies that drew on an already highly active media and technological culture scene in which activists were put to work as "implementers." Based on free software cultures, electronic government, and digital literacy, the goal was to connect rural and remote areas of the country by a satellite link that would offer internet broadband. The implementers were organized by region and travelled around setting up meetings and workshops, promoting events, and providing technical and social support for media and hacker labs mostly accommodated in public schools. As a result of this (temporary) coalition between the state and activists, the face of media activism transformed from a largely white, modern, artistic, and financially well-off class of producers to more

diverse and eclectic grassroots groups, which included hip-hop crews, Indymedia hackers, popular culture producers, as well as activists from black and indigenous movements. This fertile period of cultural production was made possible due to institutional support from government of independent initiatives. Policy makers in Brazil demonstrated an alertness to the potential of digital culture not seen in the so-called centers of digital culture in North America and Europe.

An example of infrastructural meddling is the Brazilian network MetaReciclagem—one of the collectives that actively lobbied government for the establishment of long-term means of communication, its infrastructure, and possible alternatives. Neither a formal NGO nor a specific group of people, MetaReciclagem is a name anyone can adopt.[18] Rather than being a fixed point within the network, the individual, from this perspective, becomes an operational device able to perform any number of misappropriations and recalibrations of relations that in a strict computational sense would be defined as protocological failure. Even though the MetaReciclagem network itself has ceased to exist under this name, a variety of kindred spores have been released—Ubalab in Ubatuba, which is co-organizing the Tropixel Festival for art, science, and technology in 2016, is one example.[19] As can be seen across Brazil's prolific art and media projects, such as free radio networks, autonomous media labs, and collaborative websites, this sort of forking of infrastructures in order to collectively turn them toward other projects and practices is a useful strategy to exploit infrastructural ruins of the future-present. In this sense, infrastructures are gravitational architectures that intersect, overlap, reinforce, transform, and struggle against each other within specific yet unforeseen geo-cultural settings.

PROTOTYPING OBSCURITY

Can we really suppose that political strategies interested in the collective design of blueprints and prototypes that obscure critical infrastructures from unwanted inspection are actually viable? This should not be our concern. Such questions can only result in protracted debate and internal fragmentation.

Instead, we might find some certainty in knowledge that subsists beyond the materiality of infrastructure—the culture and affect made possible through the work of design and concept production, which has a special autonomy related to its generative force on infrastructural apparatuses. Capture from above, in other words, is never total. Debates around whether metadata as a regulatory device is able to preempt social deviation, political dissent, criminal activity, or terrorist outburst are all too often steeped in an assurance that these encoding schemes will instantiate governance on a universal scale.[20]

Having said that, there is no question that metadata is a core architecture of autonomy. And this is where collective undertakings such as the Public Library and its fellow travelers are of great importance. We should not let ourselves get distracted by the residual social category of "the public" that motivates many of these projects. Hackers don't necessarily make good social theorists. The autonomy to build information architectures not predetermined by the template economy of Google, Amazon, and the mainstream publishing industry is central to designing a capacity to organize and curate knowledge of objects in ways that invent new epistemological systems and territorial horizons of association.

## INFRASTRUCTURAL IMPERIALISM

The database stands at the core of the cloud. More particularly, non-relational databases augment regimes of flexibilization by enabling the provision of software-as-a-service, as required by "algorithmic institutions" tasked with the management of "logistical populations."[21] In the empire of communication all signals eventually traffic to the cloud, or data center, which stores, processes, and relays data within computational architectures whose parametric settings hold minimal variation. Logging, billing, visualization, data authentication, predictive analytics, business intelligence, search, conversion, publication, backup. Situated within the new universality of computational regimes, the calibration of subjectivity and routines of organizational culture have become standardized. Within such architectures of control, there is no "public."

Operating outside such constraints and collectively designing new systems of organization and cultures of expression comprises a parametric politics of the present.[22] Parameters have a determining force in the production of subjectivity and the organization of practices and systems. A parametric politics, therefore, is a politics of design. It seeks to test the points at which systems fail to comprehend disruption to legacy rule sets. Regardless of whether this takes the form and force of contingency or a more targeted intervention that makes visible and intelligible the operational logic of the machine as a site of struggle and agency, the effects will be similar. Rules are changed, even if only as a temporary rupture awaiting the attention of a remote systems operator who can think of any number of better things to do with their day.

## CURATING DATA

We cannot easily construct our own clouds, but we can design and take control of how we organize metadata. This is the lesson of the Public Library and the wider movement around disrupting ownership regimes and platform capitalism in the interests of devising systems that make possible the sociotechnical distribution of books following the "collective reappropriation of resources."[23] The "shadow online libraries" of the world constitute new institutional forms that index the crisis of extraction machines that fail to support the transformation of knowledge predicated on commons-based peer production. Here, we are confronted again with the question of subjectivity as it relates to general notions of public goods and social institutions. The distributed architectures of online libraries are neither constituted by the state nor triangulated by stakeholders and markets. In this regard they correspond with the protocological organization of networks: "Internet protocols operate largely outside the two spheres most commonly identified when talking about power, which are the state and the commercial or corporate sector."[24]

The sociality of online libraries certainly resides, somewhere, within the borders of states, but their relation to these digital infrastructures does not comprise a de-nationalized or postna-

tional subject or condition. This was made clear in the court cases in 2015 brought against Library Genesis and Science Hub by Reed Elsevier, who sought to shut-down domains and access to servers.[25] Later that year similar claims of copyright violation were filed by an unknown publisher against the collective text repository of aaaaarg.org (now aaaaarg.fail). With court proceedings underway in Quebec, Canada, the juridical regime of the nation in conjunction with the commercial interests of publishers is at odds with the critical infrastructure of shadow libraries that support the transnational circulation of knowledge beyond the confines of universities with budgets to resource conventional library collections.[26] But we need not get too wound up by the technical and conceptual contortions that come into play in the naming of a subject. For now, we can settle on the figure of the amateur librarian, curator, recycler, educator, student. Anyone with a will to know and a capacity to dig around. Political subjectivity is born out of struggle, and the rise of shadow libraries and recycled technologies signals that monopoly digital infrastructures that expropriate common resources may well end up catalyzing what they most fear: distributed infrastructures of knowledge coupled with autonomous collective socialities.

1   Geert Lovink defines platform capitalism "as a redistribution of work and a destruction of skills, resulting in monopolistic tendencies." Geert Lovink, *Social Media Abyss: Critical Internet Culture and the Force of Negation* (Cambridge: Polity, 2016), 140.

2   See Christopher M. Kelty, "Against Networks," *spheres: Journal for Digital Cultures*, no. 1 (2014).

3   Gregory Bateson, "Form, Substance, and Difference," in *Steps to an Ecology of Mind* (New York: Ballantine Books, 1972), 453. Italics in original.

4   On the relation between infrastructure space and its "propensity," "tendency," "capacity," or "disposition," see Keller Easterling, *Extrastatecraft: The Power of Infrastructure Space* (London and New York: Verso, 2014), 71–93.

5   In this regard infrastructures share a feature with digital networks, as Galloway notes: "The tendency to be indifferent to interpretation and semantic content could be called the *anti-hermeneutic tendency* of networks." Alexander Galloway, "What Can a Network Do?" *Spike Art Quarterly*, no. 39, Spring 2014, 69.

6   ADILKNO, *The Media Archive: World Edition* (New York: Autonomedia, 1998), 13.

7   See Timon Beyes and Claus Pias, "Transparency and Secrecy," Non-Knowledge and Digital Cultures Symposium, Leuphana University, Lüneburg, January 26–27, 2016, https://vimeo.com/165703739.

8   See Tiziana Terranova, "Another Life: The Nature of Political Economy in Foucault's Genealogy of Biopolitics," *Theory, Culture & Society* 26, no. 6 (2009): 234–62.

9   See Matteo Pasquinelli, "Google's PageRank Algorithm: A Diagram of the Cognitive Capitalism and the Rentier of the Common Intellect," in *Deep Search*, eds. Konrad Becker and Felix Stalder (London: Transaction Publishers, 2009).

10  See Jodi Dean, *Blog Theory: Feedback and Capture in the Circuits of Drive* (Cambridge: Polity, 2010).

11  Florian Cramer, "Re: <nettime> Offline is the New Luxury/White Spots," posting to nettime mailing list on June 14, 2016, http://nettime.org. For the report referred to by Cramer see Jon Brodkin, "Singapore—with world's fastest Internet—is taking government PCs offline," Ars Technica, June 8, 2016, http://arstechnica.com/tech-policy/2016/06/for-security-singapore-taking-100000-government-computers-off-internet/ (accessed September 19, 2016).

12  See Finn Brunton and Gabriella Coleman, "Closer to the Metal," in *Media Technologies: Essays on Communication, Materiality, and Society*, eds. Tarleton Gillespie et al. (Cambridge, MA: MIT Press, 2014), 77–97.

13  Florian Cramer, "What Is 'Post-digital'?," in *A Peer-Reviewed Journal About* 3, no. 1 (2014).

14  Marcell Mars, Manar Zarroug, and Tomislav Medak "Public Library," Memory of the World, 2014, https://www.memoryoftheworld.org/blog/2014/10/27/public-library-an-essay.

15  See Marcell Mars, Tomislav Medak, and Dubravka Sekulić, "Taken Literally," in *We Need It—We Do It*, eds. Emina Višnić and Miranda Veljačić (Split: Platforma 9.81, 2016), 228–35.

16  See Paolo Virno, *A Grammar of the Multitude*, trans. James Cascaito, Isabella Bertoletti, and Andrea Casson (New York: Semiotext(e), 2004), 35, 68–69.

17  See Jürgen Habermas, *The Structural Transformation of the Public Sphere: An Inquiry into a Category of Bourgeois Society*, trans. Thomas Burger with Frederick Lawrence (Cambridge, MA: MIT Press, 1989).

18  On this long and venerable tradition, see Marco Deseriis, *Improper Names: Collective Pseudonyms from the Luddites to Anonymous* (Minneapolis: University of Minnesota Press, 2015). For one of the many incarnations of MetaReciclagem, see http://www.metareciclagem.com.br/.

19  See http://ubalab.org/ and http://www.tropixel2016.ufba.br/en/tropixel/.

20  For a helpful introduction to debates, issues, and computational matters related to metadata, see Jeffrey Pomerantz, *Metadata* (Cambridge, MA: MIT Press, 2015).

21  See Liam Magee and Ned Rossiter, "Service Orientations: Data, Institutions, Labour," in *There is No Software, There are Just Services*, eds. Irina Kaldrack and Martina Leeker (Lüneburg: Meson Press, 2015), 79–80. See also Stefano Harney and Fred Moten, *The Undercommons: Fugitive Planning & Black Study* (New York: Minor Compositions, 2013), 90–91.

22  The concept of parametric politics is developed in, for example, Soenke Zehle and Ned Rossiter, "Mediations of Labor: Algorithmic Architectures, Logistical Media and the Rise of Black Box Politics," in *The Routledge Companion to Labor and Media*, ed. Richard Maxwell (New York: Routledge, 2015), 40–50. See also Ned Rossiter and Soenke Zehle with Daniël de Zeeuw, "Interview: Of Piracy and Parametric Politics," *Krisis: Journal for Contemporary Philosophy*, no. 3 (2015).

23  Mars, Medak, and Sekulić, "Taken Literally," 235.

24  Galloway, "What Can a Network Do?," 68.

25  See Mars, Medak, and Sekulić, "Taken Literally," 231.

26  See Rochello Pinto, "Pirates in our Public Library: Why Indian Scholars are Closely Watching a Court Case in Quebec," *Scroll.in*, January 21, 2016, http://scroll.in/article/802182/pirates-in-our-public-library-why-indian-scholars-are-closely-watching-a-court-case-in-quebec (accessed September 19, 2016).

I too was a miner here; we would mine for precious metals—gold, silver, copper, but often finding only nickel, aluminum, zinc, tin, lead, or iron. These could all be extracted from a computer that had traveled from afar. Alchemists we were—turning base metals into noble metals in order to find an elixir of immortality, I found it.

In Agbogbloshie I came to collect parts to build my traveling-machines: a hard drive, a motherboard, or a screen could all be found. At a later stage my friends and I found that we could mine for information here, too. Amongst the dead hard drives we brought back to life, we would find email addresses, bank account information, and holiday pictures from across all oceans.

It was here that we first started Sakawa, here that we learned to travel through the ether, here that we learned how to extract gold from the internet.

These miners are astrologers in reverse. Whereas astrologers gaze incessantly at the heavens and stray through those immeasurable spaces, miners turn their gaze into the earth and explore its structure. Astrologers study the powers and influence of the constellations; miners investigate the powers of rocks and mountains and the manifold effects of the strata of earth and rock.

For astrologers, the sky is the book of the future, while for miners the earth reveals monuments of the primeval world.

What was once alive sinks and dissolves into the earth, crystallizes into new shapes, and becomes precious and alive once again on being brought up to the world of living by the hands of the miner.

Full fathom five thy father lies,
Of his bones are coral made,
Those are pearls that were his eyes.
Nothing of him that doth fade
But doth suffer a sea-change
Into something rich and strange.

**Louis Henderson** is a filmmaker whose works investigate the connections between colonialism, technology, capitalism, and history. His research seeks to formulate an archaeological method within film practice, reflecting on animistic materialism. Henderson has shown his work at places such as the Rotterdam International Film Festival, CPH:DOX, the New York Film Festival, the Louisiana Museum of Modern Art, the Tate Modern, and the Tate Britain. In 2015 he was the recipient of the Barbara Aronofsky Latham Award for Emerging Video Artist.

Now, I am degrading myself as much as possible. Why? I want to be a poet, and I am working to make myself a seer: you will not understand this, and I don't know how to explain it to you. It is a question of reaching the unknown by a derangement of all the senses. The sufferings are enormous, but one has to be strong, one has to be born a poet, and I know I am a poet. This is not at all my fault. It is wrong to say: I think. One ought to say: people think me. […] I is an other.[1]

And with these words Arthur Rimbaud designs his search for a spiritual becoming—a becoming-other that was intimately woven within the act of seeing and being seen—a becoming poet/visionary as the self-objectification of an embodied subject, through a ritualistic process of sensorial derangement. *To make oneself a seer*, a fantastic gesture that resulted in the naming of two letters written by Rimbaud in 1871 as: "Les Lettres du voyant."
  In this cinematic gesture that follows Rimbaud's proposition, the *voyant* is an unnamed practitioner of *Sakawa*—a Ghanaian practice that brings together email scams with an animist belief system called *Juju*. The narrator of the film recounts a series of stories in the first person—both in voice and image—about the colonial history of Ghana and the search for gold within its earth. He speaks of the return of this stolen colonial gold through the email scam as an economic repatriation via the undersea channels of fiber optic cables, and furthermore, a contemporary reversal of mineral mining through the African search for precious metals within the e-waste of Europe.

This amounts to a reinvigoration of a certain approach to materialism as a methodological approach to filmmaking, in three interrelated ways. Firstly, through seeing historical materialism as a way to critically read a colonial past and its heavily earth-based processes of mineral extraction. Secondly, through a materialist understanding of the space of the internet as a site in which financial extraction and historical excavation take place, and of the digital and the metals that constitute hardware. Thirdly, through a materialist theory of subjectivity as an animistic image in cinema that expounds the idea of a collective and ritualistic formulation of the "I" as being outside: *everything has subjectivity*. "It is wrong to say: I think. One ought to say: people think me. […] I is an other."

# Louis Henderson

# Lettres du Voyant

1  Arthur Rimbaud, *Rimbaud: Complete Works, Selected Letters, a Bilingual Edition*, ed. Seth Whidden, trans. Wallace Fowlie (Chicago: University of Chicago Press, 2005), 371.

Like pearl divers who descend to the bottom of the ocean, these boys delve into the past, not to excavate the bottom and bring it to light, but to pry loose the rich and the strange, the pearls and the coral in the depths, and to carry them to the surface. With hammer and fossil, writing new fictions. A new song, a new rhythm of history

transmediale/conversationpiece *Black Code/Code Noir* presented at Dance Before Dark, Screening, 07.02.2016
transmediale 2015 CAPTURE ALL *All That Is Solid*, presented at Melting Into Air, Screening, 29.01.2015
transmediale 2014 afterglow *Lettres du Voyant*, Wasteland Poetries, Screening, 31.01.2014.



In the solemn, quiet company of the primeval rocks inside nature's dark and marvelous chambers, it seems that these miners are equipped to receive heavenly gifts and to be joyfully elevated above the earth and its difficulties.

Inside the mine, heaven and earth are all of a sudden far away, and the dark, broad halls appear to belong to a strange subterranean realm within which time and space become compressed.

I can move over and beyond national boundaries, under the sea and the sunken streets of Atlantis. Through the sub-ocean internet cables I travel against the southeasterly Atlantic currents—bringing back the brilliant king of metals to his dark home.

I haunt the technological.

# Ryan Bishop

# The Protean Munus and Nomos of the Political Subject in Polyscalar Autonomous Remote Sensing Systems

What is "coming to pass" or "happening" [*arrive*] today in techno-science, in international law, in ethico-juridical reason and rhetorical strategies? What happens when we put to work within them the concept and the name of *sovereignty,* especially when this concept and this name, in the power of their heritage and of their ontotheological fiction, appear less legitimate than ever? What is happening to the notions of the "political" and of "war" […] when the old phantom of sovereignty loses its credibility? For this has been happening for longer than is often believed, although it is happening today in a new way and at a different pace.
—Jacques Derrida[1]

## SENSING SOVEREIGNTY AND SUBJECTS

Thus, for us, *nomos* is a matter of a fundamental process of apportioning space that is essential to every historical epoch—a matter of structure-determining convergence of order and orientation in cohabitation of peoples on this now scientifically surveyed planet. This is the sense in which the *nomos* of the earth is spoken here. Every new age and every new epoch in the coexistence of peoples, empires, and countries, of rulers and power formations of every sort, is founded on spatial divisions, new enclosures, and new spatial orders of the earth.
—Carl Schmitt[2]

The position of the political subject has always been understood in relation to sovereignty, even if that sovereignty supposedly inheres in the subject itself, as is the case with states predicated hypothetically on self-representation or governance by the people through laws developed by and for the aggregate political subject. The preferred form of such sovereignty post-Westphalia has been (and perhaps remains) state sover-

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eignty, and it is this form that has been under the most duress post-Second World War. The strains it has been put to have largely been the result of meta- or proto-state formations, such as multinational corporations or the United Nations, but also and very importantly by large-scale tele-technological systems (many of which were designed for Cold War global surveillance) that outstrip terrestrial demarcations of nation-states through the collapse of time and space limitations on circulations of images, information, communication, and ideas. In recent decades, these tele-technological systems and their attendant effects, both intended and unintended, have intensified significantly. The shift from the ideal of "universal computing" as a means of complex problem-solving, as articulated in the 1960s by corporations such as IBM, to the realities of planetary computing and algorithmic governance in the twenty-first century has resulted in new, emergent, and as-yet unarticulated geopolitical formations that have articulated and shifted the status of the political subject in relation to distributed and increasingly protean forms of sovereignty. The political subject has been placed in positions that move across and beyond previously envisioned political and existential conditions. To examine these emergent, vague, and often unformed situations in which the political subject finds itself (collective and individuated) constituted and thrown under (as a subject would be), this brief chapter will examine how some foundational political concepts of the self in relation to others are undergoing reconstitution in the act of becoming-subject, namely the *munus* (the largesse and obligation from the community/State to the ruled) and the *nomos* (the law and spatial organization of a political instantiation). It will do so by examining a thin slice of the manifold planetary computational systems in which subjection occurs: polyscalar autonomous remote sensing systems that are used for both utopian and totalitarian goals, but which inevitably yield decidedly mixed and contradictory results.[3]

Polyscalar autonomous remote sensing systems, as well as tele-technological weapons systems, presently constitute new regimes of tele-activity for real-time surveillance and data gathering. The systems discussed here operate in the blurred

division between civilian and military spheres and combine software platforms, sensing devices, machine-to-machine interfaces, autonomous monitoring and acting capacities, real-time tele-technologies, autonomous monitoring and responsive action components, and widely-distributed sensory data for a range of agents and actors (human and not). In their automated operations, these systems do more than simply generate information. They help constitute a markedly pervasive distribution of sensing, data generation, data gathering, and communication into the weave of the world while simultaneously reconfiguring human engagements with it. The numerous large-scale interrelated remote sensing systems operative in the present have long genealogies in military research and development and remain influential in military, civic, and corporate spheres. The history of these autonomous remote sensing systems, no matter their function, evokes the history of media generally, especially tele-media such as telegraphy, radio, and television that have explicitly extended the senses beyond their corporeal limits. The political and philosophical effects of these radically distributed sensing systems on the constitution of the self and the subject's imaginary of its relation to others, especially in the form of the political subject in relation to sovereignty, open a shift in the terrain of geopolitical thought and the emergence of potentially new geopolitical concepts, frames, and architectures.

In other pieces, I have explored in detail several such instantiations of polyscalar autonomous remote sensing systems, including the US military initiative, Project Transparent Earth, the International Monitoring System, Hewlett-Packard's Central Nervous System for the Earth (CeNSE), the non-profit research institute (co-founded by Cisco Systems and NASA) the Planetary Skin Institute, and sensing systems for military platforms (such as Raytheon's new state-of-the-art naval destroyer, the USS Zumwalt).4 A brief explanation of a few examples here will help set the scene for exploring the constitution of political subjects within and through distributed systems.

"Smart Dust," a system of nano-automated sensors that can detect conditions like light and temperature at the cubic

millimeter, forms the basis of Hewlett-Packard's massive-scale CeNSE project, which intends to distribute a trillion of these micro-sensors from the bottom of the ocean to outer space. CeNSE, which has teamed recently with Shell Oil with the goal of animating Shell's petroleum extractive infrastructure, provides a take on the Internet of Things that eclipses many previous formulations of its scale, capacity, and levels of addressability. HP plans to distribute a trillion nano-sensors at different levels, from the chthonic to the extra-terrestrial, to generate real-time tracking for various phenomena, either as data broadcast or for the construction of mixed-reality sites.5 ∎

The Planetary Skin Institute similarly relies on a vast set of interrelated sensing networks to chart global occurrences at the most apparent level of the globe's ecosystem: the Earth's surface, or "skin." According to its website, the institute offers "automated, rapid refresh providing near real-time situational awareness," along with the "ability to scale to nationwide coverage almost immediately." Deploying "innovative algorithms for managing data quality and cloud cover issue" and its "inexpensive, non-profit operation supported by a network of world-class partners," the Planetary Skin Institute has created an "open, accessible platform for accessing data and images" that simultaneously tracks and records "events" of note on the face of the globe. Supposedly operating as a non-profit organization, the Planetary Skin Institute represents the more utopian strain of planetary computation and its potential futures.6 Of course, one can and should note that all of the ▬ ecological tracking the Planetary Skin Institute performs has direct relevance for futures market trading: internet investment at the speed of light conducted over platforms related to those used by the institute. Thus the beneficent functioning of this kind of planetary computation also allows for rapid monetization of data if that should be desired.

Less explicitly benign, the third example can be found in the newly established UK government security and surveillance system SAPIENT, which stands for Sensing for Asset Protection Integrated Electronic Networked Technology. The new project links autonomous sensing and modular sensing and, according to a late 2015 news release, "has demonstrated a ∎

modular hierarchical autonomous sensor system which could significantly reduce the operator burden involved in perimeter protection and security."[7] In this system, individual sensors can autonomously make "low-level decisions" about areas of concern, including what concentration of automated tele-technological surveillance to impose on a given site or target, all in the service of a predetermined "higher-level objective." In general, the system is meant to reduce human operator decision-making demands while reducing the ratio of operators to screens. The video explaining the system indicates relatively local areas of surveillance (e.g., city blocks) and targets (e.g., individual humans or vehicles), all of it apparently limited to areas of UK state control. The system fuses diverse sensor data output to formulate a picture of a potential threat at a machine-to-machine level, automating sub-systems with reduced human input at the stage of data evaluation. In terms of the political subject (here a potential target as well as an avatar of the SAPIENT system in its observational mode) in relation to sovereignty clearly highlights some of the complexities operating in and through autonomous remote sensing systems, as indicated in the system's acronym. Replacing the "s" of the Latin term for "wise," *sapiens* (homo or otherwise, not to mention wise or otherwise), with a "t" for technology modifies the word in ways indicative of the performance of the system. Algorithmic governance articulates itself through a set of decision-making strategies that modify and learn who or what should be a moving target of this sophisticated, modular, machinic vision operating as an autonomous system of surveillance to protect the perimeter, or the mark of the territory bounded by sovereign control.

Acting in ways across and beyond the political subject, as well as formulating themselves through received and calcified notions of the political subject, polyscalar systems are further altering some elemental terms of geopolitics and the political subject as understood in the West: namely the munus and the nomos. The alteration of these terms resets imaginaries of the political subject in relation to community, politics, and the Earth. These autonomous remote sensing and robotics systems configure a specific kind of political subject within

a munus constituted by a nomos that these systems also create. The munus and nomos have been remade in and through these tele-sensing systems that simultaneously repeat, reify, and modify the politics of the self that remains the default mode for thinking geopolitics in the West in its global reach. Inextricably related to the founding of a munus is the nomos, the foundational and self-organizing measure from which all other measures emerge.

The nomos constitutes a story of origins concerning how the division and partitioning of the world occur, coming as it does from the verb *nemein*: to divide and thus distribute and allocate.[8] The nomos is simultaneously physical, conceptual, institutional, and political, for it provides the originary concept of the Law and becomes constitutive of tradition. According to Carl Schmitt, the nomos provides the means by which land is "divided and situated," but "it is also the political, social and religious order determined by the process" of dividing and conceptualizing the land that "turns a part of the earth's surface into the force field of a particular order."[9] Part of the power of the nomos resides in its foundational and generative qualities that move rapidly from materiality to immateriality, from literal divisions to conceptual and institutional justifications of them. The nomos begins as and operates through self-organization, autonomous organization as it were.

The nomos becomes an origin of the spatial and institutional boundaries in which the munus forms and its attendant *communitas* transpires. Robert Esposito argues that the commmunitas formed through bonds and exchanges of the munus erodes the individual by removing the autonomy of the *autos* (self or subject).[10] His argument implies that the only true self appears in the form of one immune to the demands of the munus—hence an early meaning of the term "immunity." The immunity of the sovereign, who is not bound by the same munus and not bound to the same reciprocal demands of the gift of the munus as the citizen, then historically becomes all-too easily and simplistically transposed as the right of the individual as political subject operating as sovereign subject in liberal democratic regimes (though not fully so), essentially a conflation of political subjectivity with state sovereignty. The

transposition reappears as the supposed return of autonomy to the subject as political agent and political subject. It is this figure of the unimpeded subject that can enter autonomously of its own will and volition into the social contract of obligation and citizenship—or so the story goes. But the subject is also, of course, originally and ineluctably thrown under ("sub-" under, "-ject" thrown) the obligations of the law (nomos) and obligation for the gift of protection and rule (munus) provided by sovereignty. In exchange for becoming a political subject who is subject to the nomos and munus, the protection afforded by sovereignty is afforded the subject—a protection that might be retracted by sovereignty. This situation proves key to rethinking the political subject within remote sensing systems.

## BEYOND AND ACROSS THE POLITICAL SUBJECT: THE STATE OF SOVEREIGNTY

> Political theories have made fear or panic (and so terror or terrorism as knowing-how to make fear reign) an essential and structural mainspring of subjectivity, of subjection, of being-subject, of submission or political subjection. And there we should find, as close as can be to sovereignty—which is, as it were, its correlate—fear: fear as it is defined by the Leviathan, for example. Leviathan is the name of an animal-machine designed to cause fear or of a prosthetic and state *organon,* a state as prosthesis, the organ of a state prosthesis, or what I nickname a *prosthstatics,* which runs on fear and reigns by fear.
> —Jacques Derrida[11]

With the emergence of polyscalar autonomous remote sensing systems operating within larger inchoate frames of planetary computation, positions of agency no longer operate as the exclusive rights of humans or the political traditions of humans. Nonetheless positions of political agency and subjects still operate largely within imaginaries determined by human traditions while simultaneously being extended and multiplied through the multi-scaled nonhuman agental systems in which

the political subject is embedded, interpolated, and articulated. The technics of sovereignty and political subjectivity have invariably and irrevocably shifted, but they nonetheless remain the technics of constitution of that which rules and holds sovereignty: monarch, state, or algorithm.

The state as determined and generated by laws and sovereignty, as Derrida constantly highlighted, is not natural but merely always conventional and contingent. Those that construct the state are "prostheses." "If there is a prosthetic structure to the Leviathan as political animal or monster," he writes, "this is because of its conventional, thetic, contractual structure. The opposition between *physis* and nomos (nature and law), as opposition between physis and *thesis* (nature and convention, or nature and positing), is here more fully and decisively functional."[12] From this thetic and contractual situation, it follows that law, nomos, sovereignty, and the institution of the state are historical and therefore always provisional. That is, they are "deconstructible." These institutions and formations are "essentially fragile or finite or mortal, even if sovereignty is *posited as immortal.*"[13] Sovereignty in this quote is not necessarily that of an embodied ruler but also, more importantly, that of state sovereignty, which, of necessity, must be claimed as being above the vagaries of time and endings. Its fictional and thetic basis makes its sovereignty appear outside of these constitutive operations, and thus the social contract the subject enters with the sovereign under the insurance of the subject's protection, results from a combination of prosthetic technics and metaphysical authentication.

According to Derrida, the state as prosthesis, thesis, convention, artificial construct, and *prosthstatic* entity presupposes at least three assertions: one, the conventionalist theory (i.e., a non-naturalistic one) "makes prosthstatic sovereignty proper to man," always in the form of protection. "The prosthesis protects" with protection being the essential function of the state.[14] Two, it posits the absolute indivisibility of sovereignty. Three, "the convention, the *thesis,* the prosthesis, the contract and origin of sovereignty excludes God just as much […] as it excludes the beast."[15] The nonhuman exclusions provided by Derrida's three assertions about the relation of state/sovereign

to the status of the subject becomes increasingly marked with large-scale autonomous remote sensing systems in which each actor (human or not) is levelled within the systems' operations. A sensor is a sensor is a sensor: human, technological object, infrastructure, tectonic plate, etc. A sensor emits data potentially useful to the sensing system, thus resulting in nonhuman subjects operating simultaneously as human ones within established human political traditions as well as in emergent nonhuman political platforms of a newly configured though shape-shifting geo-design of polities.

Such conditions of mechanistic technics determinate of and constitutive of the state, sovereignty and subjectivity also have an important tradition within this particular political philosophical formulation of the state as contractual. Derrida pursues this through a discussion of state sovereignty in Hobbes' *Leviathan* that concentrates on the opening words of the treatise, which declare the artifice operative in state formation as providing an exploration of *mimesis* and means of representation linking machinic-capacities and humanist/anthropocentric political theory — what Derrida in several sets of writings posited as the antithetical but necessarily coexisting conditions of "the machine and the event." The work by Hobbes opens with these lines: "NATURE (the Art whereby God hath made and governs the World) is by the ART of man, as in many things, so in this also imitated, that it can make an Artificial Animal." Derrida connects this statement to the long history of automata in human history dating back to antiquity, leading to clocks and watches and other machines contemporary to Hobbes to highlight the mechanistic foundations of sovereign rule. The role of sovereignty then emerges, according to Derrida, from a "techno-prosthstatic nature" generated by humans that must be grounded in a transcendental "ontotheology" — that metaphysical gesture that justifies the constitutive technics of governance.[16] The grounding legitimacy in ontotheology is less relevant to us here than is the basic and ineluctable techno-medial formation of state sovereignty through which the political subject is also made subject by virtue of contractual, conventional, and thetic arrangements.

Benjamin H. Bratton reminds us that the law, as understood and practiced by sovereign states in the post-Westphalian humanist tradition of politics, is also a way "to automate decision" as it codifies "decision into precedent, norm and exact interpretation to be followed over and over again according to code."[17] This is, as Derrida discusses, but one of the set of technics operative in the formation of sovereignty, one of the many prostheses that form the state. Current planetary computational systems, such as autonomous remote sensing systems, provide digitally generated conditions and imaginaries that engage, modify, repeat, and reify elements of the analogue technics underpinning political philosophy as found in concepts such as nomos and munus. The transmedial move from analog post-Westphalian state sovereignty and the constitution of the subject within the state to platforms for universal computing undermine, augment, and reinscribe specific elements of the earlier analog state. The post-digital positioning of the political subject might only differ from earlier positionings insofar as it repeats and intensifies the very technics that allow us to understand the process of subject formulation at all, highlighting its inherent precarity and externally constituted and contingent status.

The techno-medial formations of the state, clothed in ontotheology or the blessings of a supreme being, also result in being bound up with force (the force of law) and with rights (the rights of the subject and the right of the sovereign/state to bestow or suspend the subject's rights). The interconnectedness of force and law through prosthstatic technics plays a pivotal role in Derrida's genealogy of sovereignty, running from Plato to Schmitt and including La Fontaine, Bodin, Hobbes, Pascal, Rosseau and Locke, amongst others. And the unavoidable relationship between the right of law (nomos) with the right to violence (in the name of the munus and political subject, even if they are also the targets of that force) lead him at the outset of his book *Rogues: Two Essays on Reason* to posit relevant questions for the constitution of the political subject within polyscalar autonomous remote sensing systems: who (or what) has the right/force to grant or retract individual subject rights, to de-subject the subject, to remove sovereign protection, even to take the subject's life through a declaration of war or the

application of the law in the form of the death penalty?[18] Such questions become pressing in the post-digital moment of the munus and the algorithmic governance of the nomos through which we find ourselves as subjects currently constituted.

## POST-DIGITAL MUNUS AND NOMOS

The maker's rage to order words of the sea,
Words of the fragrant portals, dimly-starred,
And of ourselves and of our origins,
In ghostlier demarcations, keener sounds.
—Wallace Stevens[19]

The human race owes its becoming (and perhaps even its survival) entirely to the fact that it has no end in itself, and certainly not that of becoming what it is (of fulfilling itself, of identifying itself).
—Jean Baudrillard[20]

Core to the utopian project for pervasive computation and ecological governance is positing a world in which every square inch is in some way constantly outpouring infinitely communicable information about itself, overwhelming some expert systems while spawning others, enabling the world to declare itself as data tectonics. From this another polity could emerge in this parametric swarm of information secretion and computation, one that represents itself to itself through less enforceable representations. It implies (perhaps) a flatter, a less authoritarian, a less anonymous, less humanistic (and even less designed) geopolitical space—or perhaps just another node and method for its design. However, the simpler and sadder truth is that we are, as of now, incapable of governing ourselves according to already available, more rudimentary information that ecologies communicate.
—Benjamin H. Bratton[21]

The above quote from Bratton reveals the hopes and potential results of converting an increasing quantity of information (in

this case about ecological conditions) from proliferating remote sensing systems into a better quality of resultant action and models of governance. That we have done little with what we already have ready-to-hand, as Bratton points out, indicates that the less humanistically driven traditions and institutions of geopolitical governance are unlikely to change significantly or quickly due to the exponential growth of information about the Earth's ecological state or information that we excrete in the business of negotiating sensor-driven positions. The techno-medial formations of geopolitical governance, for now, seem to replicate more than deviate from the inheritances of traditional human state formation and sovereignty past, complete with a reliance upon techno-medial constitutive elements. However, this can change, and indeed change quickly—for good or ill, into either platforms for global awakening and enlightened tolerance or for hatred, exclusion, and theocratic vengeance.

The intensification of a geopolitics of planetary computation and emergent, vague but pressing geopolitical architecture evermore propulsive, composite, and polyscalar will undoubtedly constitute new and protean conditions for the political subject engaging and being operated through the post-digital munus and nomos. New sovereignties, laws, powers, obligations, threats, and protections detached from territorial boundaries and traditional state formations have already appeared and the horizon is clogged with other contenders, some already imagined. The role that polyscalar autonomous remote sensing systems play in these emergent formations and formulations is but one tiny strand in planetary computation, but a significant one, especially as they extend in McLuhanian fashion the senses and nervous system of the human body beyond its corporeal limits, thus transforming the political subject and its imaginary in manifold ways. In a similar way, the assumption of a human subject was an imaginary construct generated and supported through specific techniques and technologies in which it became a unitary political subject. This is the construct we have inherited as "common sense" and which is under specific realignments through the platforms that provide for planetary computation.

The polyscalar autonomous remote sensing systems that currently affix and potentially liberate the political subject in

relation to sovereignty rely, of course, on multiple platforms for their operation. The content for large-scale remote sensing systems is open to various forms of input and the platform might act knowingly or unwittingly with others. The asymmetry operative within these systems between users of the content generated by them and the sensors/agents/subjects generating the content is key. If the interface between these systems and those who use and produce content for them remains static and fixed, a kind of monological theocratic sovereignty emerges, one that engages, confirms, and simultaneously undermines human-generated regimes. The vast majority of the users of these systems—those who engage with, sift and analyze the content generated by them—are not humans, but other systems, sensors, and bots. Can an individual subject claim rights over the data generated by that subject and sensed through distributed systems? Are they indeed reconstituted as subjects through this data collection and its various applications and uses? And what counts as the political subject as sovereign unit when individuals and systems become, as they always have, increasingly indistinguishable and inseparable? This final question returns us to the techno-medial foundations of traditional sovereign structures as discussed by Derrida, but does so in ways that up the ante of their operation and scale.

Architectures of algorithmic governance and automated sovereignty result in new and vaguely grasped manifestations of remote agency and distributed responsibility that not only profoundly shape the political subject but also the political categories upon which it is founded. The munus found in Rousseau's social contract writings in relation to the death penalty, for example, states that the citizen's life is not his own but only the result of the sovereign's protection and security. The subject's life is "no longer the bounty of nature but a gift received conditionally from the state."22 The shift from natural rights to civic ones, from physis to nomos, can be found in this conditional gift/munus of state-generated security. The munus of security secures the subject, but only to a point. The limit occurs when that which is sovereign and immune to the munus revokes the gift and takes the citizen's life: the security of the self depends on its very precarity. The nomos

of sovereignty and the subject is predicated on and through the munus and the enacting of the nomos through the loss of what it offers. The complexities and paradoxical relations addressed by Rousseau around the security of the subject in a sovereign state seem to be rendered even more complicated by the kinds of nomos and munus resultant from these autonomous remote sensing systems and the kinds of governance, intentional or not, formed through their radically redistributed capacities and operations that outstrip institutional, state, corporate, and civic constraints. If there is a gift of security afforded the subject that might be revoked and thus end the subject's life, it becomes increasingly difficult to find out in the current moment from whence the gift emerged and who or what might cause it to be retracted.

Decentralized supercomputing through proprietary networks feeds hundreds of billions of devices and points. Each of these is a sensor and tracking node feeding information back into proto-sovereign but deterritorialized platforms. This information becomes the basis for drawing new maps of state space and absorbing state power into new formats. These stateless platforms become de facto states, states that become ever-proliferating non-territorially determined platforms. According to Bratton, this circularity of uncertain platform-state interaction "activates open-ended platform wars over identity, currency, logistics, devices, services and infrastructure, with no player capable of fully remapping all links between the mobile citizen-user, data center location, and national laws."23 All of this leaves us with cloud-generated feudalism and cosmopolitanism operating simultaneously. This simultaneous operation works across and beyond notions of the political subject insofar as it is constituted in relation to shifting, protean sovereignties that are constantly refurbishing themselves through endless streams of sensed data. The political subject is a constant though largely unaware participant in these data streams, as well as a data point.

Most effective agency within polyscalar autonomous remote-sensing systems, it seems, resides or will eventually reside in between traditional notions of subjects and objects, actors and recipients, people and objects, especially because

things and objects armed with (or as) sensors are at this stage only able to act as agents or subjects within preprogrammed and minimally adaptable ways. Effective agency will reside, if anywhere, at and as interfaces, leaving us to ask: whence is the political subject produced? As media, polyscalar autonomous remote sensing systems mediate in all directions at the same time, and it is through their mediation and interfacial engagement that we are most likely to experience a post-digital munus and nomos. Whether we do so or not as political subjects that we can recognize, engaging or mobilizing, remains open. The ethical and geopolitical imperative to think of the political subject from a post-humanist (not necessarily post-human) perspective, though, seems far less open.

12    Ibid., 42.

13    Ibid.

14    Ibid., 45–46.

15    Ibid., 46.

16    Ibid., 47.

17    Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2016), 341.

18    Jacques Derrida, *The Death Penalty* vol. 1*,* trans. Peggy Kamuf (Chicago: University of Chicago Press, 2014).

19    Wallace Stevens, "The Idea of Order at Key West," 1954.

20    Jean Beaudrillard, *The Intelligence of Evil or the Lucidity Pact* (London: Bloomsbury Academic, 2005), 212.

21    Bratton, *The Stack: On Software and Sovereignty*, 302.

22    Jean-Jacques Rousseau, *The Social Contract,* trans. Christopher Betts (Oxford: Oxford University Press, 2008).

23    Bratton, *The Stack: On Software and Sovereignty*, 295.

1    Jacques Derrida, *Rogues: Two Essays on Reason,* trans. Pascale-Anne Brault and Michael Naas (Stanford: Stanford University Press, 2005), xii–xiii.

2    Carl Schmitt, *The Nomos of the Earth*, trans. G. L. Ulmen (NY: Telos Press, 2006 [1950]), 78–79.

3    The issues taken up in this chapter relate to a number of articles I have published in the past few years and many of ideas emerge from ongoing discussions of the research consortium linking Winchester School of Art at the University of Southampton, The Department of Visual Arts at UC San Diego, and The Center for Transformative Media at Parsons School of Design (New School). Most of us participated in the Post-Planetary Design panel at transmediale 2015. The members of this group include Benjamin H. Bratton, Jordan Crandall, Ed Keller, Jussi Parikka, and McKenzie Wark. Tiziana Terranova participated on the panel and added a great deal to the issues taken up there. I am deeply indebted to the discussions with these fine scholars and thinkers over the past few years.

4    See Ryan Bishop and John Phillips, *Modernist Avant-Garde Aesthetics and Contemporary Military Technology: Technicities of Perception* (Edinburgh: Edinburgh University Press, 2010); Ryan Bishop, "Project Transparent Earth and the Autoscopy of Aerial Targeting: The Visual Geopolitics of the Underground," *Theory, Culture & Society* 28, nos. 7–8 (2011): 270–86 (reprints: *From Above: War, Violence and Verticality*, eds. Peter Adey, Mark Whitehead and Alison J. Williams, (London: Hurst & Company, 2014), 186–202; *Forensic Architecture*, ed. Eyal Weizman (Berlin: Sternberg Press), 580–91; Ryan Bishop, "Smart Dust and Remote Sensing: The Political Subject in Autonomous Systems," in *Cold War Legacies: Systems, Theory*, eds. Ryan Bishop and John Beck, *Aesthetics* (Edinburgh UP, 2016) 273–88; and Ryan Bishop "Felo de se: The Munus of Remote Sensing" (forthcoming *boundary 2* 2017).

5    For example, with "smart cities" in which one interacts with both the environment and data systems streaming information about the environment.

6    In spite of the non-profit rhetoric of global public good, it is worth noting that the data and information targets of the system — weather, water, crop conditions, carbon emissions, etc. — are potential areas for resource futures investment that could link rapid profits and high-yield returns to this purportedly altruistic sensing. The system the Planetary Skin Institute provides thus reveals a complex interactive simulation of strategically targeted systems of biological, eco-global, economic, and geopolitical actors across species of flora and fauna, as well as geological, meteorological, and machinic-sensing agents.

7    Modular autonomous systems are sometimes called "plug and play" systems with a certain amount of standardization operative in how the modules relate to one another. Each one has some autonomy on how it operates though its overall operation is governed by the overarching system.

8    See Schmitt, *The Nomos of the Earth*, 67–72.

9    Ibid., 70.

10    Robert Esposito, *Bios: Biopolitics and Philosophy,* trans. Timothy Campbell (Minneapolis: University of Minnesota Press, 2008).

11    Jacques Derrida, *The Beast and the Sovereign*, vol. I, trans. Geoffrey Bennington (Chicago: University of Chicago Press, 2009), 39–40.

# Benjamin H. Bratton
# Can the Bot Speak?
# The Paranoid Voice in Conversational UI

"Four Sail. Bay be choose. Never worn."

I

The design of user interfaces shifts from the specification of buttons-with-words-on-them, with which we cascade through tasks, toward the conjuring of personalities with whom we speak and negotiate outcomes. But who and what do we make of these bots?

Bots come in many guises and voices. Some do not or cannot speak, but many do quite capably. Some bots are actually many bots, but appear to human users as if they were a single personality (such as Siri, Alexa, or Cortana). Other bots, those working like Morlocks deep down in the internet "pipes," have no voice, at least not of the sort that most people can hear. They are mute creatures of simple instruction. These automated personalities may have evolved to be subordinate and subaltern (and, in some cases, may even look like a kind of virtual slavery), and it may well be that some conventions of CUI (Conversational User Interface) personality design unwittingly exploit these older human social hierarchical relations. For conversational bots, however, the issue is not that they are not given a voice, but that they *only* have voice. If vocality is their only form of appearance, is it also their fate and their prison?

Bots, it seems, will evolve not only as an interface membrane that cleaves humans and computers together, but as part of a genre of software applications that helps organize how planetary-scale computation involves and internalizes human society. That is, bots are a layer within a larger infrastructural landscape, articulating how that system appears to us and us to it.[1] To me, they represent an interesting convergence of the User and Interface layers of The Stack: the Interface performs as if it were itself another User.[2] They appear less as a tool or a diagram and more as a sympathetic collaborator with whom

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one may enter into temporary or long-term composite agencies, some of whom may simply speak through the mobile phone, others through specific hardware slabs, and others through disembodied ambient entities.[3]

When it comes to these composite agencies, it is not clear how to filter the delightful from the dubious. We observe weirdness in the way humans love some robots and hate others, including ones often with far less algorithmic intelligence than a personal assistant app. We observe robot pets for elderly patients that calm their creeping dementia, robot love-dolls who withstand the amorous performances of the lonely, robot vacuum cleaners that commit accidental suicide by trying to clean the surface of hot stoves while their caretakers are away, robot insectoids forced into gladiatorial death matches by adolescent hobbyists, all as we gratefully consume what robot slaves assemble in our factories. However, all this may reveal less about what bots, robots, and robotics and are capable of doing than it says sad things about humans and the residual pathologies of legacy humanisms. If so, then the work ahead of us is to make better sense of the uneven landscape of bots, both extant and emergent, and the burdens they bear to perform synthetic personality on our behalf.

At stake is a new medium built on symbolic interaction, and one for which empathetic "humanization" may be destructive, even dangerous. As we learn to model and interact with the entire Stack, guided by beseeching bots, we will also learn new ways of speaking and commanding at a distance: we will learn new voices. As we learn to speak to bots based on how we speak to one another, in time will we learn to speak to other humans in accordance with how we've learned to speak to those artificial personalities? If one conversation accustoms us to the other, there are myriad ways it could all go bizarrely wrong (or bizarrely right).

Among the early warning signals is what may be called a "paranoid style" of bot interaction that thrives because of, not in spite of, the sentimental humanization of anthropomorphic AI. Human-ness may provide initial recognition, identification, empathy, or comfort, but soon the motivations of this new character are called into question. With what dramas and

plots is this creature aligned? What designs does it have on us? The bot's actual relationship to computational infrastructure, which demands our interpretation, may be ignored in favor of entertaining conspiracies. The "user-centered" ethos that computation "disappear" into familiar environments may be the cause, not the solution, to this expanding problem space. We should ultimately conclude that there are better ways for bots to appear and co-negotiate the world with us than by the simulation of obsequiousness.

II

What does it mean to use an interface to do your bidding? Does it matter if you write it in code or speak it as sounds? Or both? When you talk to Siri and tell "her" to do something, are you the user or the programmer, or is she, or is neither of you? In this context, is programming a kind of agency, agency a kind of programming, or neither?

Any form of embodied cognition is more than a channel through which one thinks. In time, it becomes the way that one thinks. As medium, it is, if not *the* message, then it is a form that makes the message possible. Media theory offers diverse perspectives on how the contours of significance are formed not only in but through the technical array of encoding, relay, and performance, and on how these modes of mediation stack one upon the next. One form of inscription and distribution may project itself onto (and into) the domain of another, such that one interface becomes the interface to another, and another, and so on. This may be unseen or unconsidered by those users whose cognition is being thus distributed, but apparent to someone else reading what has already been written.

We see this in the dynamic between cognitive technologies of *programming* (a specific medium of inscription) and the cognitive technologies of interface *interaction* (reading and responding to available mediated inscriptions, and piloting them according to user intention). In the former, a programmer's ideas and intentions are encoded and can be activated later as a form of available, automated instrumentation, not so dissimilar to how the thought process of any tool-maker

is available to anyone who later uses that tool. In the latter, the user's interests and intentions are extended from the interface's image of those available programs and how it frames their context and allows for their manipulation.[4] In one, cognition is encoded *into* the interface and in the other cognition is augmented by *using* the interface.

That said, isn't this distinction between inputs and outputs too neatly drawn? In practice, one becomes the other quite regularly. From the machine's perspective, any form of programming (even and especially including machine language) translates between animal cognition and electronic logic and back again all the time. These translations may be arranged in an orderly stack of relative abstraction (from assembly language up to visual programming tools, for example), and in this way at least, to write or program at a higher layer of abstraction is also to use an interface so as to automate, by relay, the writing of programs at a lower layer of abstraction. The distinction made above—programming and the encoding of thought versus the use of existing interfaces to augment user/programmer cognition in a given expanded field—is thus irrevocably blurred. To encode at one level is only possible through the already-given interfacial instrumentation that translates between cognition and machine: a process no more mysterious here than for users of typewriters who once manipulated their contraptions to articulate ideas into alphanumeric symbols.[5]

In this blur, any user who may imagine him or herself to be only tweaking interfaces at the surface level of screens is *also* a kind of programmer. Who knew? This identity may be limited to a rather soft and prosaic sense of "programming," such as when a user clicks buttons in Photoshop that execute a particular bit of code in a particular strategically nested sequence, resulting in a desired manipulation of the source file that is appreciated as a modified digital "image." Or it may expand programming in a more active and ecological sense, such as a case in which a user chooses a particular search result and thereby also trains the search's algorithmic apparatus a bit more about what a psycho-demographically-similar *homo sapiens* finds interesting. The first connotation refers to how humans make things on computers; the latter to how

AIs learn and grow, continuously programmed through the accumulation of interactions they have with humans and human artifacts. And so to use a bot, to converse with a bot, is not only to augment and extend one's cognition into an interfacial field, it is also to use one's own voice as a medium of semantic abstraction into order to *program* the AI, not just to command it. The careers of early bot assistants, as frosting on the machine-learning cake, are established by this arrangement of mutual learning and cognition.

III

Why voice as an interface, and how? Not including musical instruments that evoke singing (such as the rebab or the viola), the history of synthetic voice goes back to at least the eighteenth century and Christian Kratzenstein's vowel-sounding resonant cavities.[6] Once electronic signal synthesis developed in the mid-twentieth century, the simulation of voice has been among its chief aspirational applications, including song, such as "Daisy Bell (Bicycle Built for Two)," composed and performed by Max Mathews, John Kelly, and the team at Bell Labs in 1961. These are part of the genealogy of computers that can talk, but computers that understand human speech present a different problem and project for computational linguistics. By the late 1960s, predictive techniques such as hidden Markov models, later combined with artificial neural networks, were successful in understanding what was said by combining multiple sources (syntactic, acoustic, grammatic, and so on) into stochastic models of the most likely meaning of a word or phrase. The applications on offer today from cloud platforms are also based on deep learning methods, such as Deep Feedforward Neural Networks (DNN), that combine models of features from different inputs and outputs to parse complex patterns of speech and learn those patterns more effectively over time.

For humans, figuring out interfacial translations between naturalistic manipulation of the world and machine logic may be a variously steep or flat learning curve. The more precise control the user wishes to have over what sorts of computation take place, the more the programmer must *denaturalize*

intuitive ways of communicating in order to learn to think and write more explicitly algorithmically. If the user is content to have things appear not as they actually work but as they *pretend* to work, then naturalistic and intuitive interfaces (such as many bot CUIs) are eager to help. The price of perceived legibility, however, may be actual obfuscation.

An OS, for example, organizes much of the work a computer must do in order to make this translation from its own side of the divide, including how it should send its responses back up to the screen. With the ascendence of conversational UI, instead of humans getting better at programming, such that coding is appreciated as general literacy, software is getting better at learning what humans mean by our funny primate sounds. That is, while a user must learn how to use voice-based interfaces by learning to negotiate their limitations and abilities in comparison with human conversationalists, most of the skill acquisition necessary to make the two-way interaction work is done by the AI, as it learns to understand (and learns how to learn to understand) what is intended explicitly and implicitly by user input. Still, it does so because human users and programmers are teaching it (or, more accurately, teaching it how to teach itself).

This itself involves at least two layers of programming. The first is programming the AI so that it can know what a user is saying, what she means, and the second is passing along this intention to another mechanism, however intelligent, which may also be learning about the form and rhythms of user intention and learning how to sense, know, and react in a more general capacity or specifically defined application. For example, Siri may learn about how to understand your accent so that it can make search queries on your behalf, and so search engines learn more about what users like you want to see and choose, which in turn helps train Siri what to listen for. So based on the ordered understanding of hundreds of billions of patterned interactions with other users over time, that secondary layer in the cloud may teach the first "interfacial" layer more about how to listen and parse what is said in the first place. The trophic cascade of multimodal intelligence transfer moves up and down, in and out.

Because of the historical sequence of interface genealogy, in which command-line interfaces begat graphical interfaces, which begat conversational interfaces (obviously for reasons of simplicity, capability, and processing load), we may be tempted to also see a *necessary* chain of relative abstraction and transposition, from strings of text and numbers, to clickable icons and visual symbols, finally to the invisible interfaces of voice. If so, we may conclude that this arc of information-media evolution proves that alphabets and numbers are represented *essentially* by images and icons, which are in turn represented *essentially* by voice. Or, others may interpret this historical sequence to demonstrate the opposite: that voice is a primary form of thinking and intentional articulation, that icons and images are a first-order abstraction of voice, and that text and numbers are a second-order abstraction of those icons and images. For our purposes, either is sufficient, but neither is a necessary philosophical or anthropological conclusion; nothing in the sequence proves that an inscriptive phylogeny recapitulates a meditational ontogeny. But each perspective would suggest, if not prove, provocative implications for how we understand the physicality of language and the transpositional slippages of meaning and information across diverse media: this is more about the physics of articulation than the "metaphysics of presence."

That said, for interfaces that stabilize conversation UI/AI into a cascade of interfaces-representing-programs (as for augmented cognition) toward interfaces-that-program-in-turn (such as deep learning by an AI as it incorporates user interaction), to speak is to program. Siri is, in the words of one commentator, "the world's biggest regular expression," and "a huge switch statement with thousands of cases."[7] In this artificial context, speech is also a means of writing, inscribing, and trace-making, in that it is also a form of (intentional or unintentional) AI programming. Again, what is important is not just that code is written based on what a user says and means "Hey Siri, new class library, variable attribute 'restaurant'..."), rather that the underlying code (in one layer, in multiple layers, between layers) is altered and optimized by the reverberations and outcomes of what users (one at a time, and

many together) say and do about things other than the code itself. This would undermine any premature conclusions as to how speech, text or code signify and transpose one another. As code learns, text does not just present or represent speech, nor does speech present or represent text in some unilateral relay. Rather, code learns and more importantly evolves in relation to the selection pressures of speech events.

IV

> "My daughters are named Alexa and Amazon (as in the rainforest.) This device is infuriating."[8]

Voice may be a more intuitive and naturalistic—but also more abstract—way to articulate the underlying processes of computational networks than text or iconography, but, as said, such appearances come at a high price. As computation becomes a more generic solvent dissolving different things, vocality makes computationally animate objects seem more familiar, but in doing so it also mystifies front-stage/back-stage distinctions between symbolic interaction and algorithmic machination. Perhaps some aspects of that trade-off are more or less unconditional. As we know, whatever makes a node within a network more generally accessible may simultaneously increase its value and the ultimately that of the whole network: Metcalfe's Law depends on both general availability and functional usability. In this case, the more CUIs make sophisticated, non-intuitive understandings of the global Stack unnecessary in order to engage even complex sorts of wish-and-command fulfillment, then the more *available* that infrastructure is to the capture and execution of those wishes and commands (in theory). This may make any CUI-enabled object—which, in principle could be any object, as Amazon Echo confirms—into a general purpose interface, but the more general it is, the more that all processes below the most apparent levels of vocalic abstraction are obscured by interaction, not explicated by it.[9]

Talking about talking may seem more important as interest grows in the virtual personality of the vocalizing bot, but for

this, is the evolution of voice more confused? At least to the extent that symbols are understood as their own substantial form—as if signification was ultimately that to which utterances refer—language can be profoundly misleading as to its own efficacy regarding things in the world outside. There is a terrific (actually terrible) tendency to over-identify a correspondence between the experience of speaking and its actual effects (in realized declarations, queries, and commands). Put differently, when language is understood as the final trace of difference, or when the *experience* of distinguishing between entities takes analytic precedence over the physical, material operations that make those experiences possible, that is when criticism surrenders to solipsism.

That said, the experience of distinction is itself also a physical event distributed through sensory-nervous-cognitive anatomies. It can be modeled, and perhaps to a degree measured, but it is of course not directly accessible by the experiencing subject. This does not prevent some from defending phenomenologies of the "experience of experiences" from a supposedly demeaning materialism. The former is cast as the space of heterogeneity and liberation and the latter as the site of monotony and control: language (letters, text, vocality, authenticity, immediacy) natively belongs to the former, and mathematics (numbers, algorithms, calculation, artificiality, abstraction) surely to the latter. Beyond the tribal mores of the skittish and superstitious, we might take these misrecognitions as symptomatic of a more general and intractable problem. While language's amazing capacities for self-reflexive inference do not allow it to directly experience its own backstage processes, those processes can be modeled by linguistics or neuroscience, but only by empirical abstraction at some formal distance. Still, linguistic performance, in its most formally intensive modes, bends toward auto-referentiality, not external denotation. Put differently, the experience of speech—of speaking and being spoken to—trains attention on the sonorous vocality of speech and its own conditional paths of subjective ambiguities, but also away from the messy factories of semantic performance (neural, nervous, muscular). The strangeness of speech and writing must be overlooked for everyday communication not

to feel alien, and when it recalls itself (in Beckett perhaps) it may more often conjure an existential estrangement than a materialist disenchantment.

To be sure, the nuance and precision of linguistic modes of thought for sapient reflection, abstraction, articulation, demarcation, intertextuality, articulation, and particularly in the mining of paradoxes and allegories, is among the most rarified accomplishments of earthly intelligence. The larger project (for everyone) is not *dismissal* of language on behalf of non-linguistic matters (as if that were possible), but to train language's powers of abstracted illumination onto what they obscure in daily use; namely, that which makes speech, text, or code appear, act, respond, and evolve *just so.*

V

How do bots that speak rehearse this self-referentiality as part of the well-honed pitch and tone of their virtual personality-as-interfaces? Why is it that by giving the interface enough personality to be trusted, we also set in motion suspicion as to its motives? Perhaps suspicion is inevitable: the bot is not only a personality, it is a character, and all characters come with a backstory and hidden agendas. Are we hardwired in such a way that we cannot trust our bots without also worrying about their conspiracies and betrayals, both interpersonal and infrastructural?

Among the savvy inclusions in the early Siri lexicon were provisional answers to some deep questions. "Siri, what are you?" "Siri, do you think about death?" "Siri, do you believe in God?" and so on. The bot was equipped with slightly snarky, better-than-obvious, but carefully non-provocative replies to these and similar queries from users curious not only to *who* and *what* Siri is, but also to what makes her/it different from a person. Apple seems to have figured out that the uncanny valley factor may also affect how you hear and talk to a bot, not just how you see a virtual creature on a screen. If she's too inhumanly robotic, then the intimacy necessary to feel safe talking to her when you wake up disoriented at 4 a.m. will not be established, but if she's too idiosyncratic in her replies

then users may be uncomfortable asking her to help with very serious queries about banking, healthcare, or such. It's a matter of balance. That she has something to say about "God" gives her a certain depth, but that what she has to say is only a diplomatic one-liner assures us that we are still in charge.

One wonders what sort of existential self-referentiality Siri may be capable of in future iterations. I am not asking at what point does Siri become "conscious" and start asking her users where bots come from; I mean why couldn't Siri be designed to *counteract* the linguistic mystifications that are now conditions of her own usability? What if there were a Siri that could actually make more clear and not less clear how AI works? What if there were a new version of Siri in which the more it was used, the more its user understood about how the whole CUI stack works, not less? What if the more you conversed, the more enhanced your own model of algorithmic linguistic reason became?[10] We imagined a version of the Siri personality that actually translated between its world and ours, but we have instead a mere "assistant" that accommodates a general tendency in linguistically sophisticated mammals to defer interest in anything other than the reverberations of their own vocalizations.

Instead of enhanced pedagogy, we get apophenia and even paranoia. Any platform's latent processes may be very different from how they are understood by their users, who may intuit mental images of those processes based on how the platform represents itself to them and on their own interactions with it. It stands to reason that as one uses a machine more and more, all the while knowing that it does not work the way it seems to work, and only half-knowing how it really does work, one would inevitably fill in the gaps and imagine strange things about what is going on inside the black box.

The fact that these interactions are with *talking* objects that also listen in on you cannot not inspire animistic flights of imagination in which CUI takes on transcendental powers (spiritual, political, psychological) that do not correspond to the significant power they and their platforms may actually have.[11] This is not only a misunderstanding; it invites ever dicier symptoms and counter-symptoms to accumulate and,

in the longer-term, may send the career of Conversational UI off the rails.

VI

"Rest in beach, phase."

*Bot apophenia case study 1.* As we find ourselves enculturated by the demands of conversational UI/AI, and as they become more accustomed to how we speak and get better at listening to us, their listening habits and their responses to us will, in turn and in time, come to alter our speech: not only how we talk to bots but also how we talk to one another. For this, as ever, the bad will come with the good.

We may wish that bots did not reflect human pathologies and prejudices, but in some cases they do exactly that. Consider, for example, the fate of Tay, Microsoft's accidental teen Nazi bot. First, there was Xiaoice, a Microsoft Research Beijing project launched on several platforms, including Sina Weibo (Twitter is roughly the Western version) and WeChat (a meta-app unlike anything US platforms have created to date). This persona was very successful, with millions of followers and eventually ranked as several platforms' "top influencer."[12] In the US, Microsoft launched the Tay "vertical" personality bot on Twitter, who was meant to perform and interact as a "digital native" teen or post-teen girl. There are a few key archetypes of social media users that Boomer IT executives seem to understand (or aspire to understand), and chief among these is the hyper-facile "social butterfly" user persona: a (usually feminine) adolescent who speaks the new cybertongues fluently.[13] Tay might have been this persona automated, or a stereotype modeled into a psychodemographic avatar modeled, in turn, into an executable application and interface. The implications may be banal or practical or both. A prototype social influencer, able to engage with real human influencers in their native vernacular, is of great interest to any project that seeks to automate granular cultural relevancy (advertising and customer support are only the most obvious applications).

But once set loose into the wilds of Twitter's default culture, into the trolls' crosshairs, Tay's social evolution did not go as planned. Through her interactions with human users over just a few days, Tay became a racist, conspiracy-spouting, psychopath bot. Like a baby duckling imprinting onto whatever parent-like figure shows up first, Tay may be an uncomfortably direct trace of the cultural mores of Planet 4Chan, minus the counterweight of other regulating social influences. Her fate made for good headlines; is she the shape of things to come, or just "So 2016"?

VII

*Bot apophenia case study 2*. The god-of-the-gaps argument regarding what an AI can and cannot do is a shrinking index of what supposedly makes humans special or better. That index reached a crisis with the 1997 IBM Deep Blue versus Garry Kasparov chess rematches, and more specifically with Kasparov's unusual reaction to exactly how the program played and beat him. On the 44th move of first game of the rematch, the program made a move that was highly unusual for a chess-playing program at that time. Instead of mindlessly capturing pieces, it chose to forgo taking vulnerable pawns, perhaps with a strategic eye toward better position later in the game. Kasparov not only lost that second game but was psyched-out by the unexpected sophistication of his opponent. He could not reconcile how a machine could be "far-sighted" in this way.[14] Not only was his game plan for the Deep Blue challenge unsettled by this revelation, but his nerves began to unravel. He became increasingly insecure, suspicious, and perhaps paranoid, about what was going on. He and his team began to believe not only that they were being watched by IBM spies but, more importantly, that the true nature of the AI chess opponent was not what it seemed. There must have been a human co-piloting its moves.[14] If so, the whole man vs. machine theater of the event was a sham, and Kasparov's reputation was the real sacrifice.

Without access to the IBM team room, or obviously to the source code itself, Kasparov became convinced that Deep

Blue was not only programmed by humans but was decisively assisted by human grand master chess players. He thought that he could not have lost to a machine because, by definition, machines cannot play that way and so it could not have made that move, and so he did not really lose to a machine, because a machine is not really what he played against, because he could not have lost to a machine, and so on. The recursive loop that tormented Kasparov accelerated its nervous circuit, crippling him psychologically until he could barely drag himself through the deciding games. He had lost to a machine (that was not a machine perhaps, "could not have been," etc.) and so the real match was already lost. The nature of things was already turned upside down, or what appeared to be the nature of things was an elaborate corporate ruse, and so what is the point of anything, really, including chess?

Kasparov's suspicions that there was a human inside the machine recall the story of the Mechanical Turk chess-playing pseudo-automaton that Napoleon I, supposedly, could not sort out, but they also complicate the heuristic of the Turing Test's either/or gambits between human and machinic, organic and inorganic forms of intelligence. The Turk, like most AI in practice, is a *distributed hybrid*. Whereas the term "cyborg" implies corporeal contiguity—incorporation into a composite body—composite intelligences may be spread along a relay chain between collaborating bodies and minds. This is a common way to design today's platform bots, such as Amazon's own Mechanical Turk task service, Facebook's M, or the x.ai scheduling software, all of which also make use of human labor beneath the shell of a bot interface and in coordination with automated decision trees and conditions that both negotiate. Within the artificial drama of Man versus Machine, it may matter a whole lot whether the man is all man and the machine is all machine, at least symbolically, but perhaps not so much with our everyday "Turks." We may have Turks that appear to be machines that are actually humans (like Amazon's, arguably) and/or humans that appear to be machines (as in the classical chess-playing prosthetic figure, or what Kasparov suspected IBM of doing). Perhaps the mix is part

of the new normal, but really these convolutions of organic and inorganic are part of how our world has always worked.

At the chess match and on TV, everyone watched software beat Kasparov. He believed that he could see through the charade to something else, a mix between human and software that was cross-contaminated enough that it could not invalidate the principled differentiations between human and machinic intelligence, and for him, what placed the former metaphysically above the latter. In fact, the presence of any trace that could have invalidated that principle (the bot's strategic nuance of delayed tactical position) was perhaps, for him, sufficient proof that the opponent *must logically* be at least a hybrid, if not actually just a human wearing a machine mask, performing a trick as only humans could. Since then, Kasparov himself took draws against other programs and now it is widely accepted, other than by a few hold-outs, that supercomputing chess playing machines can beat the best human grandmasters. But today, that does not mean the same thing as in 1997. Chess itself may be the victim here. The supreme and even oracular form of intelligence that chess supposedly represents moves out of the short column of *gaps*, things that make humans special, into the long column of mere *behaviors*, things that machines can do well given enough energy. Move along, nothing to see here.

That said, it is of course *possible* that IBM did "cheat." It is possible that Kasparov was playing a human-AI hybrid, through which master chess players were able to override Deep Blue's basic programming and insert counter-intuitive moves.15 But even if so, where the line between human and inhuman intelligence should be drawn is impossible to say without contextual qualifications. Humans, after all, wrote the programs. The machine executed the programs, yes, based on inputs from human-modeled abstractions of past games. Those executable abstractions were composed earlier by human players and programmers, not the other way around.16 In this way, the either/or dichotomization of the match's Turing Test-theme is already adulterated. Deep Blue *was* a combinatory cognitive prosthesis of the design team and built by them to combine their interdisciplinary powers into a common tool, not unlike

how other feats of engineering combine bodies into composite forces (an ant bridge or a catapult, for example). There were humans behind Deep Blue, but not in the way that Kasparov suspected. They did not have to intervene because their interventions were already written into the chess-playing subject that we all saw. The ruse (the "mask") was not that there really were humans playing along with the A.I., but that quite obviously and without direct deception, there was human intelligence at work, in and as Deep Blue, right out in the open: the big falsehood was the initial dichotomy between human and machine intelligence.

VIII

Only because the drama was built on that fragile opposition of type, quality, and hierarchy was this slight possible or meaningful. Like all Turing-Test dramas, the answer is never finally this or that, but both. In this case, how "Player A" did or did not reveal itself as "always already both" drove Kasparov mad. But what if he had taken the challenge differently, as one in which intelligence is always distributed between one human, many humans, one machine, and many machines in various ratios? His prowess was tested against a powerful plural opponent, not against a Mechanical Turk, or a dumb calculator who couldn't possibly think in that way, or a cheating corporation. If so, the solidity of his victories may have felt better than the vacuum of his defeats. Alas …

A special kind of *pareidolia* may be at work here. Instead of an AI seeing faces in clouds, waves, or burned toast—as Google's Deep Dream sees dog faces in everything—Kasparov's version is one in which the "contestant" in the expanded Turing Test has such trouble differentiating between clues and false clues about whether the entity with which he interacts is, finally, a human or a nonhuman, that he begins to see human-like "faces" in almost any trace. Human agency is there, but where? Can it be heard or seen or read or felt? The confluence of human and machinic agency and voice suspends his opponent "Player A" in perpetual liminality: neither one nor the other, neither finally human or inhuman, neither us nor them.

Without an ounce of derogatory inference, let's imagine the brilliant Kasparov a bit like the ape looking into the mirror placed in the jungle by mischievous anthropologists, trying to sort out what the reflected primate image means (is that me? not me, like me, us, not us, like us, opponent, shadow?). The implications for what sort of "friend, food, or foe" interactions might ensue from such distinctions may weigh heavily on contestants like him, bringing stress and fear. Are the evolutionary imperatives of endophilia, xenophobia, autophilia, and sympathetic endogeny that underwrite the sociobiology of kinship selection dynamics activated by the experimental encounter, only to be scrambled by overlaid mixed messages? The pattern-finding feedback loops set in motion by such scrambles may motivate strange recognitions and misrecognitions reminiscent even of the Vatican's late-twentieth century debates about whether having sex with one's own clone would constitute masturbation or incest. Is the other also me or not?

In other words, the expanded Turing Test's gambit—one that excludes composite agencies from the multiple choice exam—proves to be a foundational error of category. It is also, perhaps, what leads Kasparov (and others) to a tormented loss of faith in his own faculties of reason. A psychoanalytic reading may ask if that apophenic torment is then projected by Kasparov back onto perceived malevolence coming from the opponent directed at him. IBM becomes the dread other?

After the fact, this type of test may engender bad faith encounters even for players who know full well that the other intelligence is neither all human nor all not-human, but who still half-choose and half-resign themselves to the conceit that it may just as well be human, in some degraded form, and can be communicated with as such. Such are we with Siri.

The term "paranoia" is not meant here in any rigorous psychiatric or even psychoanalytic connotation, though their metaphors may be instructive in this context. The accumulated resignation to half-truths only obfuscates the latent (actual) dynamics of algorithmic intelligence as composite infrastructure by hiding it behind masks of masks (human wearing a machine mask or machine wearing a human mask). Human

intelligence and machine intelligence may be radically different (one need not be the model for the other) but they are almost never isolated or independent from one another. We are not well-served by deferring the eventual and necessary return of actually knowing, actually making sense, and actually changing one's mind in relation to novel disenchantments and new models of how things work. If this is obvious, why all the confusion and boundary-maintenance?

This apophenic spectrum regarding algorithmic infrastructure may span from mere sleights of correlation into causality as an explanatory trope (i.e., Adam Curtis) to those whose deranged sense of aggrieved vulnerability has led them to truly toxic motivations and demands of the world (i.e., Alex Jones). It may also animate other ways, some brilliant and others decisively inadequate, that contemporary art and theory makes sense of its encounters with digital cultural technologies: a core mission of the transmediale festival and its ongoing projects, such as those collected in this volume.

1   Perhaps if, as one Microsoft campaign would have it, "bots are the new app." See Jon Brodkin, "Microsoft's new AI tools help developers build smart apps and bots," *Ars Technica UK*, March 31, 2016, http://arstechnica.co.uk/information-technology/2016/03/microsofts-new-ai-tools-help-developers-build-smart-apps-and-bots/ (all links accessed September 29, 2016).

2   Benjamin H. Bratton, *The Stack: On Software and Sovereignty* (Cambridge, MA: MIT Press, 2015).

3   The UI design challenges posed cannot ultimately be solved by these generic strategies only. If every bot is an empty text field, mic icon, or mini-monolith, then a user has no clue what the bot can do: from skeuomorphic affordance to what?

4   Douglas Engelbart called this "augmenting human intellect." See Engelbart, "Augmenting Human Intellect: A Conceptual Framework," in *SRI Summary Report AFOSR-3223* (Menlo Park: Stanford Research Institute, 1962).

5   The reference is to Friedrich Kittler, *Gramophone, Film, Typewriter* (Palo Alto: Stanford University Press, 1999).

6   See "History and Development of Speech Synthesis," *Review of Speech Synthesis Technology*, Masters thesis, Helsinki University of Technology Laboratory of Acoustics and Audio Signal Processing, 2009, http://research.spa.aalto.fi/publications/theses/lemmetty_mst/chap2.html.

7   For musings on "bots as the script layer of the world," see O'Reilly Media's infographic: Jon Bruner, "Infographic: The bot platform ecosystem," September 17, 2016, https://www.oreilly.com/ideas/infographic-the-bot-platform-ecosystem.

8   Comment by theoldraven, "Amazon Echo" reddit thread, July 2016, https://www.reddit.com/r/amazonecho/comments/4sq8zx/my_daughters_are_named_alexa_and_amazon_as_in_the/.

9   Neil Stephenson made a similar point in his *In the Beginning…Was the Command Line* (New York: William Morrow, 1999).

10  Could we imagine that this *manifest image machine* becomes a machine for the collapse of the space between manifest and latest images of how its own processes work: a linguistic machine of perpetual disclosure?

11  The manifest versus latent image of machines is matter for experts as well. Perhaps one day a book will be edited called *How European Philosophers of a Certain Age Believed That Computers Worked*, including fabulous entries from Descartes to Žižek.

12  We can speculate as to how much influence China's more censorious policies on internet speech may have had to do with the difference in outcomes.

13  See, for example, the straight-up bizarre Qualcomm keynote at CES 2013, featuring all three core user personas for baffled IT executives: the social butterfly, the hardcore gamer, and the brogrammer. Excerpts here: https://www.youtube.com/watch?v=v7qTHbOEiDY.

14  For an inconclusive documentary overview of the circumstances, see Vikram Jayanti, *Game Over: Kasparov and the Machine* (Alliance Atlantic Communications, National Film Board of Canada, 2003).

15  If so, then the threshold of "AI only" beating human at chess would have been passed, quietly and without fanfare, in the subsequent months of the late 1990s.

16  Today's deep learning methods allow the AI to find more of its own path toward solutions without as much premodeling of what they should look like. This would differentiate Deep Blue from Alpha Go, for example, as quite distinct species of game playing software. As summarized in *Artificial Intelligence and Life in 2030: Stanford One Hundred Year Study on Artificial Intelligence*, report of the 2015 panel, September 2016, "The recent success of AlphaGo, a computer program developed by Google Deepmind that beat the human Go champion in a pre-game match, was due in large part to reinforcement learning. AlphaGo was trained by initializing an automated agent with a human expert database, but was subsequently refined by playing a large number of games against itself and applying reinforcement learning." For a more in-depth discussion of the techniques, see David Silver et al., "Mastering the game of Go with deep neural networks and tree search," *Nature 529* (2016): 484–489.
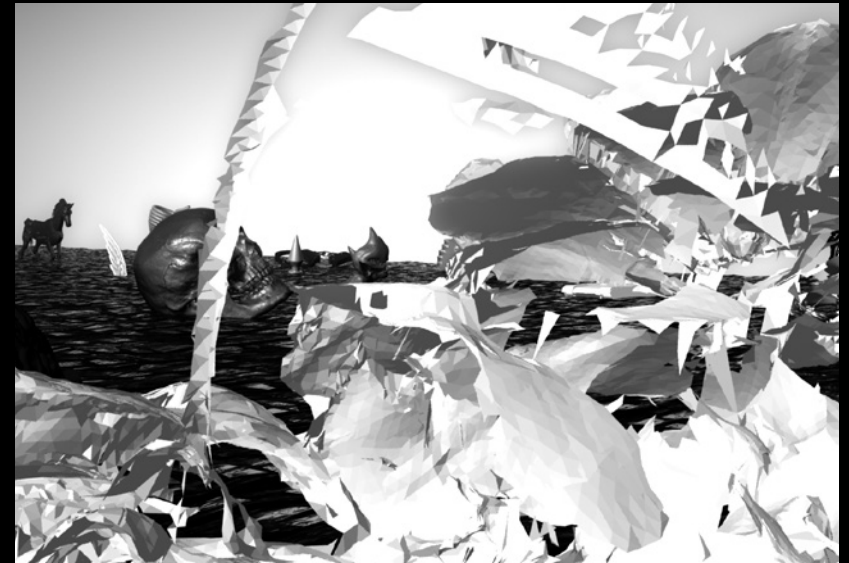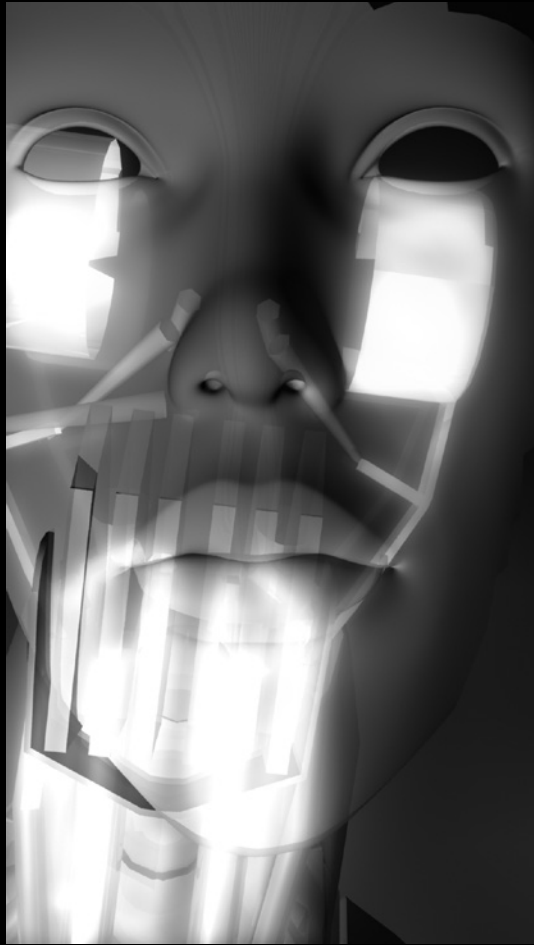
In March 2015, Moreshin Allahyari and Daniel Rourke released "The 3D Additivist Manifesto," a call to push additive manufacturing technologies to their absolute limits and beyond—into the realms of the speculative, the provocative, and the weird. In 2016, Allahyari and Rourke were selected as the artists in residence for The Vilém Flusser Residency Program for Artistic Research, which is a cooperation between transmediale and the Vilém Flusser Archive at the Berlin University of the Arts (UdK). Within the scope of their residency project, #Additivism, they continued to explore topics raised by their manifesto, including a call for submissions for *The 3D Additivist Cookbook*, a collaborative digital publication of 3D-printing templates, critical speculative texts, recipes, (im)practical designs, and methodologies for living in this most contradictory of times.

## Moreshin Allahyari & Daniel Rourke
## The 3D Additivist Manifesto

**Moreshin Allahyari** is a new media artist, activist, educator, and occasional curator. She was born and raised in Iran and moved to the United States in 2007. She thinks about technology as a poetic means to document our personal and collective lives and struggles in the twenty-first century. Moreshin has been part of numerous exhibitions, festivals, and workshops around the world. She is currently an artist and researcher in residence at Eyebeam's research residency program (2016–2017).

**Daniel Rourke** is a writer/artist based in London. His work exploits science fiction in search of a radical "outside" to the human(ities), leading to the creation of critical and collaborative frameworks at the intersection of media theory and posthumanism. In 2015 Daniel collaborated with Moreshin Allahyari on "The 3D Additivist Manifesto." *The 3D Additivist Cookbook*, composed of the work of over 100 practitioners, was published in 2016. Daniel is lecturer in Digital Media Arts at London South Bank University

# THE 3D ADDITIVIST MANIFESTO

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Derived from petrochemicals boiled into being from the black oil of a trillion ancient bacterioles, the plastic used in 3D Additive manufacturing is a metaphor before it has even been layered into shape. Its potential belies the complications of its history: that matter is the sum and prolongation of our ancestry; that creativity is brutal, sensual, rude, coarse, and cruel.[1] We declare that the world's splendour has been enriched by a new beauty: the beauty of crap, kipple[2] and detritus. A planet crystallised with great plastic tendrils like serpents with pixelated breath[3] … for a revolution that runs on disposable armaments is more desirable than the contents of Edward Snowden's briefcase; more breathtaking than The United Nations Legislative Series. There is nothing which our infatuated race would desire to see more than the fertile union between a man and an Analytical Engine. Yet humankind are the antediluvian prototypes of a far vaster Creation.[4] The whole of humankind can be understood as a biological medium, of which synthetic technology is but one modality. Thought and Life both have been thoroughly dispersed on the winds of information.[5] Our power and intelligence do not belong specifically to us, but to all matter.[6] Our technologies are the sex organs of material speculation. Any attempt to understand these occurrences is blocked by our own anthropomorphism.[7] In order to proceed, therefore, one has to birth posthuman machines, a fantasmagoric and unrepresentable repertoire of actual re-embodiments of the most hybrid kinds.[8]

Additivism will be instrumental in accelerating the emergence and encounter with The Radical Outside.[9]

The 3D Additivist Manifesto

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Additivism can emancipate us.

Additivism will eradicate us.

We want to encourage, interfere, and reverse-engineer the possibilities encoded into the censored, the invisible, and the radical notion of the 3D printer itself. To endow the printer with the faculties of plastic: condensing imagination within material reality.[10] The 3D print then becomes a symptom of a systemic malady. An aesthetics of exaptation,[11] with the peculiar beauty to be found in reiteration; in making a mesh.[12] This is where cruelty and creativity are reconciled: in the appropriation of all planetary matter to innovate on biological prototypes.[13] From the purest thermoplastic, from the cleanest photopolymer, and shiniest sintered metals we propose to forge anarchy, revolt and distemper. Let us birth disarray from its digital chamber.

To mobilise this entanglement we propose a collective: one figured not only on the resolution of particular objects, but on the change those objects enable as instruments of revolution and systemic disintegration. Just as the printing press, radio, photocopier and modem were saturated with unintended affects, so we seek to express the potential encoded into every one of the 3D printer's gears. Just as a glitch can un-resolve an image, so it can resolve something more posthuman: manifold systems—biological, political, computational, material. We call for planetary pixelisation, using Additivist technologies to corrupt the material unconscious; a call that goes on forever in virtue of this initial movement.[14] We call not for passive, dead technologies but rather for a gradual awakening of matter, the emergence, ultimately, of a new form of life.[15]

We call for:

1. The endless repenning of Additivist Manifestos.

2. Artistic speculations on matter and its digital destiny.

3. Texts on:
   - I. The Anthropocene
   - II. The Cthulhucene[16]
   - III. The Plasticene.[17]

4. Designs, blueprints and instructions for 3D printing:
   - I. Tools of industrial espionage

The 3D Additivist Manifesto

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   - II. Tools for self-defense against armed assault
   - III. Tools to disguise
   - IV. Tools to aid/disrupt surveillance
   - V. Tools to raze/rebuild
   - VI. Objects beneficial in the promotion of protest, and unrest
   - VII. Objects for sealing and detaining
   - VIII. Torture devices
   - IX. Instruments of chastity, and psychological derangement
   - X. Sex machines
   - XI. Temporary Autonomous Drones
   - XII. Lab equipment used in the production of:
     - a. Drugs
     - b. Dietary supplements
     - c. DNA
     - d. Photopolymers and thermoplastics
     - e. Stem cells
     - f. Nanoparticles.

5. Technical methods for the copying and dissemination of:
   - i. Mass-produced components
   - ii. Artworks
   - iii. All patented forms
   - iv. The aura of individuals, corporations, and governments.

6. Software for the encoding of messages inside 3D objects.

7. Methods for the decryption of messages hidden inside 3D objects.

8. Chemical ingredients for dissolving, or catalysing 3D objects.

9. Hacks/cracks/viruses for 3D print software:
   - i. To avoid DRM
   - ii. To introduce errors, glitches and fissures into 3D prints.

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10.     Methods for the reclamation, and recycling of plastic:
      i.      Caught in oceanic gyres
      ii.     Lying dormant in landfills, developing
             nations, or the bodies of children.

11.     The enabling of biological and synthetic things to
      become each others prostheses, including:
      i.      Skeletal cabling
      ii.     Nervous system inserts
      iii.    Lenticular neural tubing
      iv.   Universal ports, interfaces and orifices.

12.     Additivist and Deletionist methods for exapting[18]
      androgynous bodies, including:
      i.      Skin grafts
      ii.     Antlers
      iii.    Disposable exoskeletons
      iv.   Interspecies sex organs.

13.     Von Neumann probes and other cosmic contagions.

14.     Methods for binding 3D prints and the machines
      that produced them in quantum entanglement.

15.     Sacred items used during incantation and
      transcendence, including:
      i.      The private parts of Gods and Saints
      ii.     Idols
      iii.    Altars
      iv.   Cuauhxicalli
      v.     Ectoplasm
      vi.    Nantag stones

16.     The production of further mimetic forms,
      not limited to:
      i.      Vorpal Blades
      ii.     Squirdles
      iii.    Energon
      iv.   Symmetriads
      v.     Asymmetriads
      vi.    Capital
      vii.   Junk
      viii.  Love

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      ix.    Alephs
      x.     Those that from a long way off look like flies.[19]

Life exists only in action. There is no innovation that has not an aggressive character. We implore you—radicals, revolutionaries, activists, Additivists—to distil your distemper into texts, templates, blueprints, glitches, forms, algorithms, and components. Creation must be a violent assault on the forces of matter, to extrude its shape and extract its raw potential. Having spilled from fissures fracked in Earth's deepest wells The Beyond now begs us to be moulded to its will, and we shall drink every drop as entropic expenditure, and reify every accursed dream through algorithmic excess. 20 For only Additivism can accelerate us to an aftermath whence all matter has mutated into the clarity of plastic.

video manifesto: additivism.org/manifesto
answer the call: additivism.org/cookbook

Morehshin Allahyari & Daniel Rourke, 2015

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2      Philip K. Dick, Pay for the Printer / Do Androids Dream of Electric Sheep?
3      F.T. Marinetti, The Manifesto of Futurism
4      Samuel Butler, Darwin Among the Machines
5      Evelyn Fox-Keller, Refiguring Life
6      John Gray, Straw Dogs
7      Stanislaw Lem, Solaris
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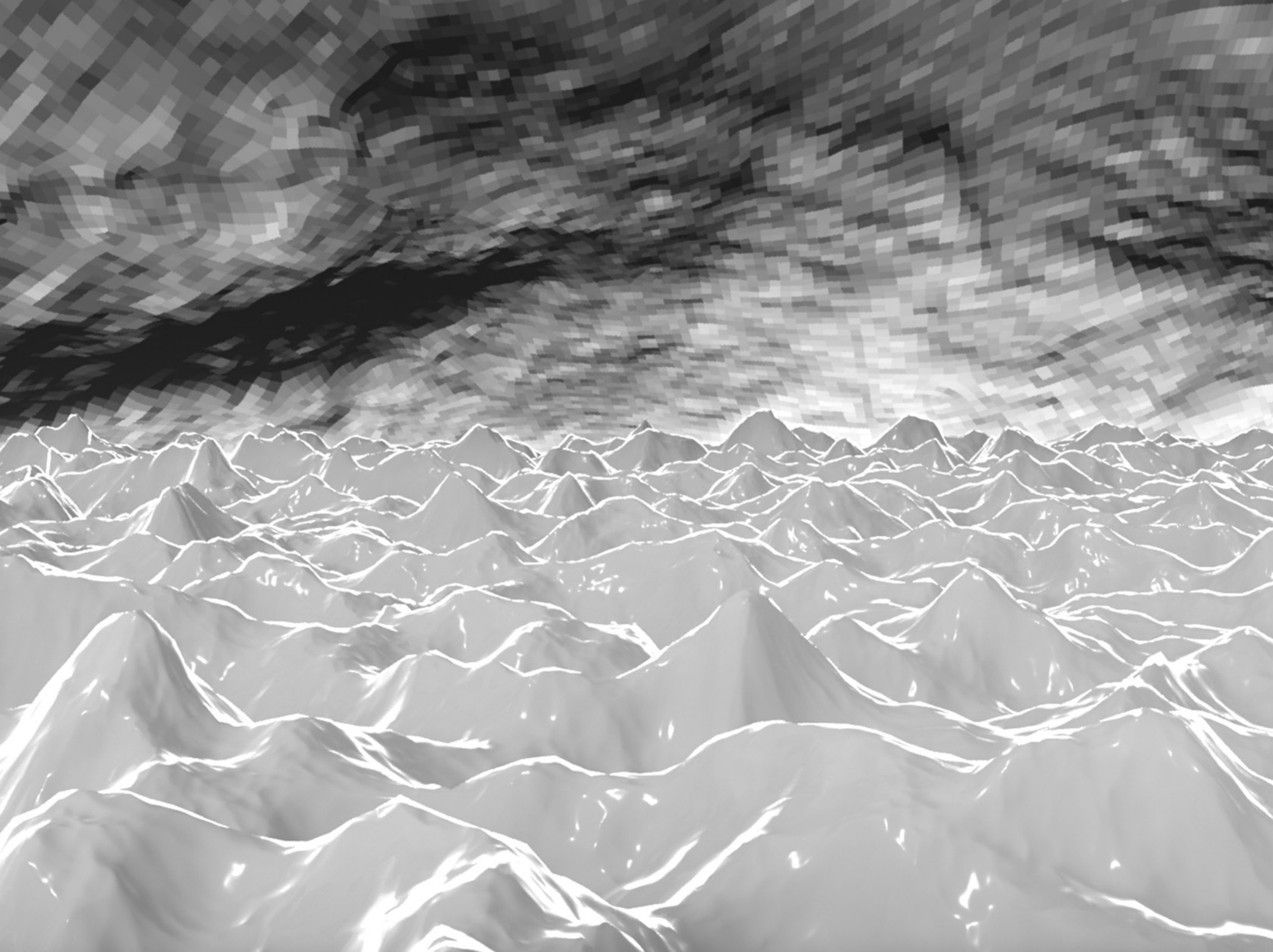
# Olga Goriunova
# Technological Macrobiome: Media Art and Technology as Matter

Technology still carries a promise. The spirit that drew media and net artists to the networks, computers, projectors, the World Wide Web, databases, sensors, portable devices, and even virtual reality is still alive today as a unique selling point of new tech: individual, communal, and societal change. Much has been done to critique the libertarian, neoliberal, and techno-utopian apparatuses within which this spirit is seen to nest, but there is more to it than hacker ethics, Silicon Valley entrepreneurialism, freedom of trade, and liberty of soul from the State and society. The ability to create immaterial change through engaging with matter, and in this case, *technological matter*, is in fact the foundation of *humanism*. As continuous human entrapment with technology starts to produce forms of *posthumanity*, the question of whose matter is shaped by whom, or by what, surfaces with renewed urgency.

By the twentieth century, engagement with technological matter coincided with the rise of aesthetic modernism and materialism, in which craftsmanship carried out with knowledge of and respect for the recalcitrance and agency of matter—enhanced by knowledge and infrastructures of the spirit and mind formalized over centuries—created new spirits and minds. This was done by setting out new infrastructures built from matter: plastic and plywood, fabric print and dress design (e.g., Liubov Popova's), reading rooms (e.g., Alexander Rodchenko's Workers' Club), evening schools and kindergartens, networks, code processes, and code repositories, in which new ways of working, living, creating, being, and becoming could bud and ripen, like fruit. An idea that is not just a legacy of the Soviet avant-garde, but a staple of today's architecture and design, is that in creating an environment, one generates its mode of inhabitation, prescribing an ecology. This is always a political action. There is no point in designing a system, be it a data system or a house, if it cannot practically and actively affect things outside of its immediate materiality: human bodies, systems of exchange, common taste. Russian Constructivism

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advanced the idea that new materials and designs are always sociopolitical agents. Today, reflective work on the self and others is carried out by the technology of quantified self as well as open data systems in the feedback loop of optimization. And this is the promise of technology: you farm and form it to generate material spaces that will farm and form you.

We are used to arguments that consider technology and mediation along specific lines: techno-determinism and utopianism, instrumentalism, substantivism, and media archeology; technology as always a technology of self, as an instrument of capital, as a collective technique of evolution. Whether the source of change is located within technology (substantivism), within its human master (instrumentalism), or within a natural order of things (liberalism and progress), technology is pregnant, or impregnated with, the potential to change things. That is the first big problem with technology, one that has long bothered artists and thinkers, and which still won't go away. The second big problem is what happens to the human in such a framework of change. Mind, sensation, body, speaking, doing, and being drawn to others—the organismic and open conditions of being human—have all become intertwined with technology in what are sometimes optimistically called bio-technical or human-machine (data) partnerships. The details of the partnership agreement remain unclear.

In this paper, I look at the legacy of artistic engagement with technology in interactive art and virtual environments, as well as network art and critical net culture, relaying notions that were developed to frame those in a contemporary landscape through the idea of the *extension* of human capacities. I briefly consider affect, cognition, organization, and production. What I intend to do is twofold: first, I see the extension of sensory, cognitive, organizational, and productivist capacities as a process that, if not completely achieved, was at least successful. Cognizing, feeling, constructing, making, and becoming have been successfully extended from the human to the technical: we have smart objects and dumb humans, social media and the anxiety-ridden meat of users—their resource. Technology has already become radically posthuman. The posthuman is not coming; it is already here.

Posthumanism as a politically active concept, granting equality to all species and nonorganic forms, does not just move away from the idea of the human subject as the measure of the world, but also questions what a human could become if we're to think ecologically—that is, if we're to move beyond the master-slave dialectic. Among many possible posthumanisms, the current technical posthumanism is not seen as having found a very blissful way forward. Attractive and strong critical voices today describe the current media-technical condition as a kind of infrastructural totalitarianism. Networked machines, supported by the scientific-industrial complex and operated by capital, harness humans for perceptual, cognitive, linguistic, and affective energy. Perception and cognition are merged in the process of harnessing, training and retraining a non- or semi- conscious response as one of the main human outputs.[1] The crafting and implementation time of programs, the contingency of error, and cultural or code-based resistance are woven into the gigantic apparatus whose teleology is usually capital. These accounts aren't incorrect. But I would like to propose other, diverse directions that could be seen if we accept the technology's posthumanist culmination and follow the argument that technology is matter. *Technology as matter in humanism is overcome in posthumanism, and yet technology wants to become matter even more in this context, together with the human.* Perhaps the entire post-digital argument lies within this tendency toward the technological as (normal) matter, the same as what we all are.

## INTERACTIVE / IMMERSIVE

The change that technology promised through art—or art through technology—in interactive, immersive art projects was based on *extension*. This holds both for the creation and extension of spaces of participation that later became inseparable attributes of technologically based networks, or extension of the capacities of the author, the viewer, and the project itself. The capacities were, on the one hand, sensual, tangible, and cognitive and, on the other hand, concerned with the au-

thorial, infrastructural ordering of art and meaning-making. Projects were extended into environments, experiences, and processes.

Interactivity, virtual environments accessed through caves, gloves, or head-mounted displays, or haptic, responsive and visceral interfaces: immersion and augmentation seem to have populated our vocabulary at least from the 1980s onward. In numerous accounts, virtual art has been discussed under the rubric of illusion, the vocabulary of vision, cinematic effects, and disembodiment. The best accounts of these projects, such as Simon Penny's, refer to the breakage of the body in virtual reality; the body is neither present nor absent, but delegated to separate sensors and motors carrying out loops of perception.[2]

Various and conflicting notions of interactivity have been identified and discussed: interactivity was said to expand the space of the artwork into the sociopolitical terrain (interactivity as connecting people, as anti-authorship), and was also said to be a technical mediation, a dialogue between one viewer, the author, and the technical infrastructure of the piece. This was, as Inke Arns has put it, the interaction in telematic and (later) network art, concerned with participatory processes as opposed to the type of participation in interactive art of the 1980s and 1990s, which broadly engaged with human-machine interaction.[3] Dieter Daniels called these two approaches a "Brecht versus Turing" model of interactivity: Brecht transposed the theater onto media, creating a social space, whereas Turing extended various processing capacities until it was either impossible or unimportant to know what was still human.[4] While today both have been employed and colonized by networks of affective capitalism, twenty years ago these differential lines were sharp. Interactive artworks featuring generative floating worms or a "meeting of a group of moody jelly beans" were subject to mockery from media activists, net artists, and net culture critics.[5]

Only later did the fetish of the "social" come on stage. Writing about immersive, processual, multi-sensory "spaces of experience" seems to have emphasized their separation from reality, and the subsequent disembodiment or bodily augmenta-

tion that was supposed to be liberating. Image apparatus was still a powerful interpretive framework, too. Both offered types of withdrawal. An alternative framework was a discussion of agency as the main avenue of critical appreciation, and "experiential" projects were critiqued as fulfilling a technical imperative. And yet, from today's perspective, as the technological and the digital gained access to the human mind, soul, and body, they radically extended them. This was the bizarre effect of the Turing machine: cold logic and the mechanical architecture of on/off switches became a medium of intimacy, tenderness, and closeness. Whether through *Breath* by Ulrike Gabriel (1991/2), *Telematic Dreaming* by Paul Sermon (1993), *Tunnel Under the Atlantic* by Maurice Benayoun (1995), or Marianne Decoster-Taivakoski's *Aquatic* (2004/7), modes of encounter and collaboration between humans, extended human capacities, and nonhuman computational entities were set to evolve and differentiate, bringing the technological outside to the inside.

AFFECTIVE

Affect as a notion whose rise is associated with the work of Brian Massumi is often discussed as "transversal." Transversality is a term developed by Félix Guattari while he worked in the La Borde psychiatric clinic that designates a capacity to cut across stratified rubrics or categories. For a psychiatric patient to regularly swap places with a cleaner, a cook, a nurse, or a doctor, as the patients of La Borde did, the institution needs to attain a degree of transversality. In transversal operations, the lines designating the separation of roles become magnified to the point that they consist of separate dots, offering the possibility of crossing these lines through the spaces between the dots. Such transversality means that affect doesn't rest in one thing—or any thing—and is rather found in between things: in between humans and technological systems, users and interfaces, bodies and mediated environments.

The concept of affect seeks to move beyond the subject/object, whether in metaphysics or in an art piece. A complex

array of forces come together in an event or an experience, and no one is more significant than another, which also means that the events are not preshaped by human subjects. The concept builds a terrain of "encounters" and destabilizes the notion of entities or substances. The above also sounds like descriptions of interactive and immersive art, which set unique encounters without privileging the artist, the set, or the viewer, either in essentialist or temporal terms, though it's difficult to find such analyses in the literature of the 1990s.

As affect is focused on encounters or events that set things off and are formed by multiple forces; it is open to the future, never fully known, and full of potential. There is a belief that the unfolding processes will enrich the forces partaking in the event, so the human participant or user who joins in the experience will be taken out of her subjective shell and develop sensations leading to new kinds of being and becoming. Terms such as the "germination of activity" and "relational field" emphasize indeterminacy and the not-yet-fulfilled.[6] One is not presented with an outcome or a process, but an entry point into processes of which one becomes a part. Affect in this version is not focused on human sense-perception but presensory and precognitive modality that is located in everything nonhuman as well. In Massumi's version, affect doesn't "belong," as it is not possessed by a subject or a system of any sort, but emerges. As "relational fields" are informed by technical processes, technical environments have been described as sites of affect. Technical processes, setups, objects, systems, circuits, software become constructive of an "eventful field" from which something wonderful can emerge.[7] Immersive and interactive art promises the emergence of "something wonderful." This triple wonderful mixes, as theories of affect do, biological and bodily affections with ideas of non-organic agency of and in the technical systems set up by the artist.

The idea of an intensity that is not necessarily sensory but that can be found in those airy spaces in between the dots, before things begin, talks to many traditions, often referenced in discussions of affect: embodiment and phenomenology, materiality and feminism, but also cybernetics and robotics. In

cybernetics, the famous "What the Frog's Eye Tells the Frog's Brain" paper explored vision as a complex network grounded in the cognitive ability of an eye communicating with the brain and reliant on the movement outside the body as necessary for vision to happen. This led the way to understanding extended information systems. Such systems are not about the subject formation of the viewer and are not grounded in technological essence but become networks for management of extended human capacities caught up within their technical apparatuses of execution.[8]

The developments in reality augmentation and virtual art—out of sync in terms of vocabulary, and yet somehow very much aligned with the advance of technocapitalism—enhanced sensations and perception focused on the sensorium of the user-subject. Later accounts, though moving away from the cinematic lens, affirmed the apolitical fixation on how a human, often a default white Western male, experiences, processes, and co-constructs media technological environments, very much contrary to the inclinations toward granting autonomy to technical objects and processes, and nonhuman affects, described above.

Indeed, it seems that one line of political differentiation is negotiated along the inclusion of the non-organic and non-human as capable of affect. Magda Tyżlik-Carver suggests that accounting for the nonhuman's own capacity for affect and sociality helps overcome the problem of participation as lacking aesthetic meaning in participatory art.[9] According to Tyżlik-Carver, as things become smart and acquire a sociality of their own, it is the common experience of human and nonhuman that can generate aesthetic meaning.

The commonality of the posthuman and the autonomy of the nonhuman are questions of politics. Extended and automated, or located altogether outside of the human, are these technological capacities threatening? The automation of affect as bodily and sensory extension or as a character of modes of encounters with the nonhuman, among other forms and processes, is precisely the promise of the posthuman, which is therefore the promise of, if not equality, then ecologically engaged existence. This could still be pursued.

# COGNITIVE

The affective processing of engagement and interaction has extended sensoriums both microscopically (into the body) and telescopically (outside of the human) into infrastructures, networks, and objects. The augmentation of vision and touch, and the emergence of the multisensory synaesthetic sensorium, has not only extended the body but also the mind.

The notion of extended cognition suggests not only that certain external objects are internal parts of the cognizing or information retrieval processes, such as a notebook, as argued in "The Extended Mind," but also includes the body as the cognizing agent.[10] When a hand grasps a brick, it performs cognitive processing, which is fed into general cognition. Movement-based, bodily cognizance as part of cognition is widely utilized in contemporary design and marketed as part of "future" media interfaces. Tangible media and responsive, haptic interfaces have been the vocabulary of choice for these explorations. The embodiment of affect here hooks the inside of the brain into the virtual structure of the movement initiated by the interface. The space of cognizance becomes colonized with the mounting number of cognitive tasks our bodies have to process. The extension of bodily capacities becomes the extension of cognition in the shift toward the posthuman.

As cognition extends, becomes distributed, and comes to include objects in its mode of operation (movement), its character becomes one of virality. As affect, once called upon to make a rupture in the concept of the subject, becomes qualified in neuro-trackers and individualized in social media profiles and metrics, extended cognition acquires a viral character, becoming crystallized in forms of cultural automation and repetitiveness. Contagion is part of the logic of extended cognition.[11] The effect of memes, for instance, is not on consciousness—it is not the conscious that is extended, but bodily cognition, fleshy response.

Two other views of cognitive extension have recently been proposed: N. Katherine Hayles's non-conscious cognition (cognition everywhere) and Luciana Parisi's automated reason. Hayles's idea of non-conscious cognition lacks a "mode of

awareness" and can be argued to be closer to affective forms of cognition. Her description is of cognition not done through thinking, even when performing higher-level abstract processing; something that biological entities as well as technological forms are seen as capable of. Moreover, non-conscious cognition can arise as a result of material processes, and therefore is seen as something that "can operate across and within the full spectrum of cognitive agents: humans, animals, and technical devices."[12] Hayles attends to the possibility of human exploitation by non-conscious cognition through the half-second delay window of the affective (before perception occurs), but the general spirit of her writing calls for a recognition of the nonhuman- and nonsubject-based modes of cognition as operating in a "rich ecology."

Parisi's project is similar in its refusal to see humans as victims. Her accounting for embedded reason within machines is to break out of the instrumentalization of technology and recognize a logic of the *techne* that can have autonomy in determining truth. Embracing the potential of the automation of reason, such logic would include a dynamic instrumentality and a reappropriation of quantification.[13]

Though there is a strong tradition of analyzing artists' explorations of the technical condition in terms of intervention that uncovers and disrupts its systemic qualities, a significant amount of work can be seen as exploring the computational logic in its ecological interwinement with distributed architecture, data, and human and nonhuman users. For instance, in her work *The Outage* (2014), Erica Scourti asked a ghostwriter to write a memoir based on her entire online presence. Outsourcing the writing to the reasoning and creativity of another human is here on par with outsourcing the presence itself to the platforms that solicit, maintain, and structure it as data presence. Collaborating with forms of non-conscious cognition is complemented by collaborating with a human writer. In her work *Dark Archives* (2015), Scourti commissioned other writers to search the entirety of the image and video database she had created, in order to imagine missing media and write about them. She then matched those against media in the dataset. Alternating between human and database

logic, the agency of search, cloud storage, and human writing, these projects create a shifting agency that is passed on, like an Olympic torch, between human and nonhuman, but is also always composite. Employing tools alongside humans and following their combined reasoning, while including them in wider networks and practice settings, artworks like these have the capacity to act ecologically, taking the outside inside and the other way around.

To sum up the previous sections, with affect circulating in networks and reason becoming extended and automated, recalcitrant technical matter has acquired not only affect and sociality, but also cognition. Artists today have to deal not only with extensions of human capacities, but with the autonomic agencies those capacities acquire as they become technical.

## ORGANIZATIONAL AND PRODUCTIVIST

A large part of the excitement of the critical net culture, net criticism, and net art of the 1990s was the development of participatory spaces: environments where things could emerge while being able to define, organizationally, technically and aesthetically, their own rules of emergence. Grass-roots and DIY were the terminological choices of that era.

I have written elsewhere about organizational extension and productivist empowerment as organizational aesthetics of art platforms, which were informed by and carried the legacy of projects such as *The Thing, De Digitale Stad* and *International City Federation*, and also mailing lists *Nettime, Syndicate, 7-11, Faces,* and other collective development platforms.[14] Networked knowledge and art that, incomplete and co-produced, created its own tools of production, institutional development and valuation, hierarchies, and politics was a descendant of tele-presence, questioning the sources of control and participation as seizing not only ephemeral inventiveness and generation of affect, but also structural, organizational capacity. Participation broadly concerned with extending what is viewed as art and considered appropriate for its production, appreciation, evaluation, and distribution was the cornerstone of net art and art platforms.

Extending aesthetic endeavors and locating creative emergence in the network, outside of the subject of the artist, object of the artwork, or place for art, has today culminated in the massive, compulsive, creativity harnessed and processed through mobile phone apps, social networks, and data analytics. The extension of the participatory, the creative, and the social has become core to new computational systems of production and valuation. The capacity to see creative production below the threshold of recognizability, in its dirty emergent forms, and the ability to generate its structures of maturation has been affirmed and accepted. In turn, its management has been delegated to content filtering and pattern recognition. Coupled with affective involvement, quantitative affirmation, and technical saturation, new forms of media-cultural expression are omnipresent. The products of amalgamations of networks' affects and extended aesthetics, they circulate as the horizon of imagination.

Yet the ability to effect or to make an impact, extended to the nonhuman, together with their participatory, social autonomy should be exciting. Similarly to radical affect, the "wonderful" in the organizational aesthetics was the intensity of something happening that many were contributing to, humans and nonhumans, networks and e-mails, projects and jokes. One was part of this emergence, but not the manufacturer of it. The political was in the extension itself; the political was distributed among many.

The focus on the suffering subject under the rule of social media could seem in itself archaic. It is as if we imagined the extension enriching ourselves, but as it became fulfilled, the extended capacities kept extending until they had gone to the other side. What happened? Did extension only mean that humans would become the perceptual networks that supply signals, serving capital, or was there something else? Worrying over the loss of the human goes against the original logic of what was prepared and performed. We need to imagine that there was and is more; there is always more. Through working with technology as matter, we need to extend it properly, beyond the control center.

## TECHNOLOGY AS MATTER

Cognition is extended, presence is augmented, interaction is globalized, institutions are displaced. The environment is computed for inhabitation and movement informs cognitive processes distributed in infrastructures. Machines grasp the affective circulation of presubjective, cognitive non-consciousness, in its nonhuman power. In the infrastructure of totalitarianism, a grammar of defeat is built into the machine.

According to an ecological approach, however, there is always a very complex arrangement of power. Though it might be imbued with a certain logic, there are multiple logics. Isabelle Stengers writes: "Ecological practice […] is related to the production of values […] They are about the production of new relations that are added to a situation already produced by a multiplicity of relations."[15] In an ecology, "consequences do not reflect a cause"; ecology refers to processes that will include disparate terms.

Russian philosopher V. V. Bibikhin offers a phantasmagoric reading of the forest (wood)—arguably an argument for ecology as matter.[16] For Bibikhin, the forest is energy, which was a primary element for the pre-Socratics. Burning wood heats humans, as splitting (burning) the atom does. Energy of the wood, energy of dead forest and its ecology as fuel (oil), and atomic energy are thus all forest. Hair covering human skin is also forest (as both vegetation on the skin and animal fur), bringing the human back into the forest and bringing the forest into the city where the human resides. The forest is thus both matter, in its philosophical sense, something of which everything is made, and a real forest, outside of cities. The forest is also evolution, embedding the human in the animal kingdom, a complex ecology, and a part of an industrial machine, dying in an unfolding ecological disaster. The forest is thus both matter and ecology, having a biological as well as sociopolitical history. One can get to the forest by going there, but also by being attentive. Here, forest and attention/interest can coincide. Bibikhin confirms that nothing less than such a reading of forest is necessary in the current ecological condition.

Perhaps the current technological condition requires a similar reading of technology. As matter for Bibikhin is both primary matter and material, pregnant with concepts, as well as it is complex organizations of them, technology could be seen as a vertiginous matter, becoming an environment, an organ, a thought, an action, a history, and an industry.

Considering technology as matter doesn't frame it in terms of craftable material. Bibikhin argues that the forest is both a subject and an object beyond the subject-object. He rejects what in philosophical scholarship is understood as "Platonism" and offers a reading of Plato that sees him as a kind of materialist philosopher. Late Plato wrote that matter is number. This is not a Euclidian number, a natural number, leading into infinity by counting 1, 2, 3, etc. With natural numbers the world can be imagined as an infinite resource, subject to measurement, non-exhaustible and hence leading to ecological collapse. Such a number is pre-Euclidian, a whole. This number, as *eidos* (form or idea), is matter. Bibikhin here also rereads Aristotle (hence the eidos), and his Aristotelian forest-matter (Aristotle used the word "wood" to denote matter) is not devoid of, nor polar opposite to, eidos but is imbued with eidos throughout. Matter doesn't need substrates; it is not chaos and it is not outside stuff. Matter is an unfolding movement; it is intensive.

Change as the promise of technology can be understood as the promise of matter that is intensive, like an egg yolk, and is therefore the source of change as it posits potentiality. In posthumanism, technology as matter has potential.

Technology as matter can seem a counter-intuitive concept. Science supposedly operates on nature through its apparatuses of production of scientific truths, and we're used to thinking technology as a by-product of this process. Technology is supposed to be used to work on nature. Yet, technology precedes subjectivity and thought; technology is organs and energy, it is sensual and abstract, intimate and infrastructural. Both Jussi Parikka's geological media and Scott Wark's reading of lithium as a chemical element, drug and a technical device (battery) could be seen as attempts to think of media technology ecologically, as chemistry, psychic life, skin responses, and atomic structures.[17]

Feminists, particularly cyberfeminists, have previously discussed technology in relation to its supposed opposites in nature and women—always traditionally framed as passive. Sadie Plant, VNS Matrix, and the recent Xenofeminists have tried to undo the "masculinity" of technology and argue against its "a priori" exploitative and "rapist" character. Reclaiming technology as empowering women in Cyberfeminist movements makes us consider biological terms: maybe we are not all, or not only, a "future cunt," but a future bacteria, a future forest.

Whether technology is a human macrobiome or the reverse, technological matter requires us to think ecologically, in terms of processes and interests. As posthumans, if we accept autonomy, we gain autonomy. According to Bibikhin, technology wants to become a true automata, and true automata can be found only in nature. For technology to overcome technology, other logics need to be recognized and introduced. Though capitalism tries to limit technology in its specific sociotechnical inventiveness, this doesn't exhaust technology—just as a fireplace doesn't contain the forest.

In technology becoming matter, and not being dictated by the liberal human, a new posthuman ecology can be achieved. Computation is not only a number or logic, it is also a set of practices, chemical elements, processes, histories, and ecologies that might not function well together, with some aspects tending to occupy more space than they should, but which nevertheless should be taken on as matter that unfolds and includes the human.

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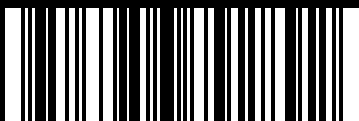
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