DeFunct

ReFunct

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Planned obsolescence was first explicitly formulated in the 1920s and 1930s as part of a strategy to promote recurrent consumption [1]. The term "planned obsolescence" already appears in the 1930s, as exemplified by Bernard London's pamphlet of 1932 titled "Falling the Depression Through Planned Obsolescence" [2]. In the 1970s, further evidence of this dynamic can found in statements by designers such as Brooks Stevens [3] and notable experts like Victor Lubeck [4].

Planned obsolescence may be described as a design strategy that pre-emptively restricts the lifespan of a commercial product, building in factors intended to promote early replacement (of the effect or intrinsic part thereof) before usability is fully exhausted. These built-in factors may be of a technical or material nature, e.g., some consumer goods manufacturers use smart chips in their ink cartridges to prevent them from being used after a certain threshold like the number of pages or time. Apple's iPod, iPhone, and iPads are manufactured with no user-serviceable parts inside, including their batteries. After approximately three years of use, the lithium polymer battery will no longer work and the device will other need to be professionally serviced or discarded. Sometimes they use this to promote a marketing strategy in which the appearance of "new" products within the same product range replaces older models to obsolescence [5].

Planned obsolescence is an especially notable strategy in the consumer technology and personal electronics market, where there is a clear premium on the novelty and iterative development of new generations of the same underlying technologies (e.g., the personal computer and the mobile phone). Stewart Brand, a senior industrial engineer at Pentagram Design, which builds portable devices and computers for companies like Hewlett Packard, says: "We joke that we design landfill" [6]. The combination of short-term design and marketing strategies and fast consumption behaviors tends to generate a fast increasing amount of electronic waste [7].

A counterpoint to the development of planned obsolescence is evidenced by the work of artists, hobbyists, hackers, activists, and sustainability-advocates who explore the latent potential of apparently "obsolete" devices. Early evidence of this tendency are the work of Reed Ghazala [8] who initiated and first conceptualized the practice of "Vintech bending" in the 1980s which has not been widely documented, studied or theorized [9]. As other emerging practices in the recycling and hardware hacking processes that are driven by necessity by Hackers and Hobbyist in western and developing countries [10]. Though driven by entirely different motivations, these practices can intersect with other. Furthermore these practices have the potential to make significant contributions into the debate of technological obsolescence.

Hardware hacking as an art practice has emerged very recently, notably in the field of electronic music as the technique of 'circuit bending' where cheap music toys and instruments are modified to create new and unique music instruments. While less prominent for visual artists, perhaps because it requires more specific skills and knowledge, it is a practice, which has seen a growth in popularity.

While it is a new practice, its historical precedents can be traced back to the cybercult, art movement of the 1960s best-known through the Iana Ratchev's central Cybernetic Sonambient exhibition in the USA in 1968. Key influences would include the installation work of Nam June Paik, the machines of John Tandy and the lesser-known work of French cybernetic artist Nicolas Schöffer.

Examples of artists and artists groups involved in hardware hacking would include the Institute for Applied Acoustics, Peter Vogel, Casey Street (Synesthesia Lab), Garth Sundemüller, Karl Klöpp, Gao Gao, Rosa Menkman, Tom Verbruggen, Ina Blau, Sven Schober and Jürgen Pundt, (Schrödinger's Cat), Ben Conant and Miguel Bacaures of Baustellung, Gurtan Barta, Nolwenn Ber, Todd Holmabek, Gordon Harris, Harold Schellin, Peter Edwards, Martin Dramante, Guntar Ebert, Nikola Collini, Cory Arcangel, Natalie Jeremiszek, T:ssa, Phil Archer, Michael Goldenboim, John Bowes, Julian von Bismarck, Cal RGB, Leopold Haan, Israel Rosenfeld, Aljos Kolkowitsch, Alexia Markert, David Wilke, Brain Duffy, Leff Reynolds, Tom Koch, Armageddon Constantini, LiYul, Stefan Janski, Phillip Theurer, and many more.

New technological developments such as the availability of low cost micro controller boards like Arduino [11] made specifically for artists and designers and the sharing of techniques and information via the Internet have made hardware hacking easier and as a result the popularity of hardware hacking is increasing as an artistic technique.
Zombie media addresses the living deads of media culture. As such, it is clearly related to the earlier calls to investigate “dead media” by Bruce Sterling and others to map the forgotten, out-of-use, obsolete and judged dysfunctional technologies in order to understand better the nature of media cultural development. And yet, we want to point to a further issue when it comes to abandoned media: the amount of discarded electronic media is not only the excavation ground for quirky media archaeological interests, but one of the biggest threats for ecology in terms of the various toxins they are leaking back to nature. A discarded piece of media technology is never just discarded but part of a wider pattern of circulation that ties obsolescence to recycling centers, dismantling centers in Asia, markets in Nigeria, and so forth—a whole global political ecology of different sorts where one of the biggest questions is the material toxicity of our electronic media. Media kills nature as they remain as living deads.

Hence, we believe that media archaeology—the media theoretical stance interested in forgotten paths and quirky ideas of past media cultures—needs to become more political, and articulate its relation to design practices more clearly. We are not the only ones that have made that call recently—for instance Timothy Druckrey writes: “The mere rediscovery of the forgotten, the establishment of oddball paleontologies, of idiosyncratic genealogies, uncertain lineages, the excavation of antique technologies or images, the account of erratic technical developments, are, in themselves, insufficient to the building of a coherent discursive methodology.”[2] We would want to add that in addition to developing discursive methodologies, we need to develop methodologies that are theoretically rich as well as practice-oriented—where ontologies of technical media meet up with innovative ideas concerning design in an ecological context.

As such, the other part of the zombie media call is the work of reappropriation through circuit bending and hardware hacking methodologies—to extend the media archaeological as well as eco-sophistic interest into design issues. By actively repurposing things considered dead—things you find from your attic, the second hand market, or amongst waste—the zombiefication of media is to address the material mechanisms of planned obsolescence which is part of their material nature. In reference to contemporary consumer products, planned obsolescence takes many forms. It is not only an ideology, or a discourse, but must accurately take place on a micropolitical level of design: difficult to replace batteries in personal MP3 audio players, proprietary cables and chargers that are only manufactured for a short period of time, discontinued customer support, or plastic enclosures impossible to open without breaking them. Whether you can open up things—the famous black boxes of media culture characterized by iPhones and iPads—is one of the biggest political and ecological questions facing our media theory and practices too.

Notes
[1] This short essay is a part of our wider project which will be published in Leonardo-journal in 2012: Garnet Hertz and Jussi Parikka, “Zombie Media: Circuit Bending Media Archaeology into an Art Method.”
The first encounter with a glitch comes hand in hand with a feeling of shock, being lost and in awe. What to do when faced with such a situation? Most people will try to find ways to hide or at least to minimize the occurrence. A glitch reveals a new aspect of the machine, a new form of communication, a new way of experiencing the world.

A glitch is a disruption in the smooth operation of a system. It is a violation of the expected behavior of a machine. A glitch can be seen as a moment of rupture, a moment when the system breaks down, revealing new possibilities and new forms of communication.

Glitches are often seen as negative events, but they can also be seen as opportunities for change. Glitches can help to break down existing patterns and to create new possibilities. They can also be seen as a way of dealing with uncertainty and complexity.

The first encounter with a glitch comes hand in hand with a feeling of shock; being lost and in awe. But to find oneself within these ruins is also to experience a feeling of hope: a negative feeling creates space for an intimate, personal experience of a machine.

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Notes
Circuit Bending
Repurposing The Past
Alessandro Ludovico

If there’s any proper “music hacker” it also has to be a “circuit bender”. But what really is “circuit bending”? To put it simply it is the process of creating sounds out of toys by making new connections in their electronic circuits. Creating new sounds out of almost nothing is compelling and all the initiates are always busy in experimenting with their cheap and crackling machines.

Who started everything
The “electronic grandfathers” of the circuit bending movement is the American Reed Gh праздновал. Эти вещи не только работают, но и сделаны из старых радиоигрушек, которые уже не работают. Электрические сигналы создавались в детстве. Это возможное определение указывает на определенную чистоту в звуке. Однако, в 2009 году циркуляр-бендинг сильно отличается от того, что мы знали ранее. Он стал более разнообразным. В 2009 году это близко связано с ремиксом. Но, как и ремикс, циркуляр-бендинг также может быть архитектурным, чтобы привлечь внимание.

In Circuit Bending
The Aesthetics Of Representation
Eduardo Navas

One might wonder what is the concrete definition of “circuit bending.” In a way, the name itself does not completely connect with the actual activity of appropriating sound from pre-existing sources, ranging from electronic toys to headphones, or even from broken and discarded objects. When I first heard the term, I thought it referred to strict manipulations of electronic signals. This possible definition harks at a certain purity in sound with specific electronic technology; yet, in 2009 circuit bending is quite the opposite, even if in the beginning it may have had a leaning towards hacking the electronic gadgets of all types. At the moment, it is a hybrid practice that appropriates any type of sound, from old recordings or pre-recorded, to recorded or significantly manipulated, even erased or remixed or captured live from the environment in which a performance is taking place to be heard immediately, on the fly.

My most memorable performance of circuit bending took place in Uruguay on July 28, 2006. I attended a soundbending event organized by Brian Mackeen, one of the first to record and present this artform from the southern cone, action since at last the “bend” was common knowledge. Mackeen, more recently has become a major supporter of sound performances of all types. The performance took place at the French Alliance of Montevideo, where I saw Mackeen and a number of other sound artists perform on customized software interfaces. A couple of performers used Max MSP and Ableton Live, while Mackeen presented a series of musical manifestations built in Flash that reminds well-known movie clips from Hitchcock and Nolan.

I see a connection with the aesthetic of sound manipulation often found in circuit bending in three performances, yet it was the performance of Szkieve (Dimitri della Faille), a Belgian-Canadian Sociologist that left a lingering impression on me. He is obsessed with collecting toys that produce noise in any shape or form with the purpose to use them in circuit bending performances. In fact, that afternoon, before the performance, I was invited by both Mackeen and Szkieve to join them on a walk in downtown Montevideo. At the time I knew that Szkieve performed with toys, but did not know exactly how he developed his sets.

That evening Szkieve used a green plastic fish toy which he had brought from a street vendor during our walk. He pulled and released a string from the fish, which then emitted an expected fish-like sound that Szkieve slowly distorted into an echo chamber abstract noise, somewhat reminiscent of dub. Szkieve then combined the loop with the distortional sample of a toy train that moved on a circular track. The pitch of the train’s motion was dramatically lowered several times, turning into a cacophonous mass of bass sound that directly contradicted the petiteness of the actual train. Szkieve also mixed sounds from various electronic devices through a mixer. If the audience had not experienced the visual development of the performance, the sound could easily have been mistaken for just another experimental electronic trax, carefully developed in a music studio—rather than from toys found at any corner store.

Szkieve’s performance is a good example of how the key to creativity is not so much the ability to produce sound from scratch, or have an advanced skill in performance, but actually to be able to conceptualize the potential of material that may already have a function, or be held together by certain values. In this sense, circuit bending is a unique link between individuals who believe that all production should be developed and manipulated from scratch, and individuals who are primarily interested in acts of sampling and recomposing material, as commonly understood in remix. Circuit bending exposes here in the end it is not important what is performed live or looped, or is a mix of the two, but rather whether or not what is performed challenges the audience’s perception of the source material. This is true not just for sound and noise performances, but artists in all fields.

I must admit that I often view circuit bending primarily as a performance based medium. My case in point is Szkieve’s performance, in which the sound may not be as interesting on its own but in conjunction with its visual development. However, Circuit bending is becoming more diverse. In 2008 it is closely linked to physical computing and all types of art installations. What is promising about circuit bending is that it can be a medium, as well as a tool. It can include software and hardware, or exclude either one, as long as its only requisit is met: that perception be best. Most importantly, like Remix, circuit bending can also be an aesthetic, to be cited in literary terms.

The search of a wet red electric nylon wire licking the bass-line of grey wooden-nails bound with the blind screams of a last name never to be famous and always worth mentioning; the beat of gracefully scratched hair longer than the history of the will, pushing the finger thatstruggles to penetrate its own castration; the speed of trust on memories. It’s much more close to the opposite. It’s about cannibalizing this old stuff, repossessing old stuff with old-style melodies and then sinking in an ocean of the present. It’s much more close to the opposite. It’s about cannibalizing this old stuff, repossessing old stuff with old-style melodies and then sinking in an ocean of the present. It’s much more close to the opposite. It’s about cannibalizing this old stuff, repossessing old stuff with old-style melodies and then sinking in an ocean of the present.
This article is a meditation on the underlying substrate (the material) of artworks produced by human/machine collaborations where the uniqueness of the machine is an essential element, the “imaginative” or creative properties of its algorithms are vital in the completion of the artwork. The idea that the machine can function as a collaborator is based on the premise that human beings have embodied their thoughts, ideas, and abstract notions into these machines—that they are a kind of funny mirror where we see reflected a distorted image of ourselves central to the ideas presented within.

Intervention

Somehow on the far side of the known universe, a wrinkle in the fabric of space-time has formed through empty space, traveling at the speed of light towards what from its perspective appears to be a tiny speck of dust in the vastness of the cosmos. This wrinkle, a highly energetic photon, a gamma ray, speeds towards its destination: a lovely blue planet orbiting a tiny star drifting in the void between the arms of a spiral galaxy. The world rushes up before it, and high in the upper atmosphere, our terrestrial collarids with an oxygen molecule. The impact create a fantastic explosion, obliterating the events of the big bang, but on a much smaller scale. Particles are produced from the energy of the impact, translating momentum into matter, exotic matter lasting for the briefest of instants: gamma rays, quarks, protons and antiprotons, electrons and positrons, protons and neutrons, unique such in the realm of space-time. As the particles scatter, the neutrinos and their counter parts leave the scene as the accident unimpeded by normal matter, ghostly, insubstantial inwards, quarks, cascade into highly energized protons and neutrons. One of these neutrons ejected from the heart of the supernova mass big bang collides a short time later with a nitrogen atom, jettisoning a proton from the nucleus, resulting in an alchemical transformation of nitrogen into carbon. Particles produced in the minis furnace of the gamma ray collision meet similar alchemical alchemy, smashing into DNA molecules of the terrestrial house below, driving random mutations with development of life. Another of those neutrons produced in the original collision tears off at near light speed, penetrating the hull of an aircraft, and slicing into the heart of its navigational computer where it meets with the nucleus of an atom in the silicon of the processor. Two cascades of transformations occur, producing a shower of positrons which annihilate electrons in the silicon of the processor itself. The neutronization of electrons is interpreted by the navigational computer as a legitimate instruction, the machine is tricked into believing it is the processor itself. This neutronization of electrons is interpreted by the navigational computer as a legitimate instruction, the machine is tricked into believing it is the processor itself, after all. The machine is tricked into believing it is the processor itself, after all. It does not know that the changed information is anomalous, the algorithms responsible for taking in data, processing and analyzing, and ultimately guiding the aircraft, run in the middle of the mind, where the aircraft rolls sharply in the night sky and descends into the cloud below.

A Failure of Materials

To err is human and to glitch is machine. Do these two characterizations of behavior have a relationship between them? If so, can we be hypothesized that there is an intrinsic connection between human and machine which make these parallel? A possible explanation which may allow for such a connection to be inferred is that a tool or technological object is a projection of human intention, desire, and ideas onto an object. If the fashioning of a complex tool can be understood as the manifestation of the dreams guiding those desires and intentions, then our failure to live up to those dreams is an indication of our limits—environmental, functional, or otherwise—which has caused it to be designed and represented by physical arrangements of transistors. Code then is the embodiment and representation of that substrate, the arrangement of that substrate to represent codified actions, the specific output media—net art, displays on video monitors, projections, prints, performed movement (this list is by no means exhaustive). In the established field of digital art, our primary materials may be considered to be data and code. The generalization that the machine is making (which may prove to be a dangerous one), is that any art works which utilize digital systems (based on binary logic) in their production involve the generation or acquisition, and processing of numerical information, which is dictated by instruction sets or code (which we will see is indistinguishable from numerical information) contained in programs. The conclusion that is drawn from this, is that digital arts has a "material" which distinguishes it from other disciplines, and any discussion of the material of digital arts (of which glitch art is a sub-genre), must include not just the data (as information) and its source but the means by which that data is generated and processed: the code or underlying instructions/algorithms.

Re-imaging Architecture of Error

Assuming that to err is human, is to glitch really the machine equivalent to error? Our brains are massively parallel biological architectures built from diverse array of neurons. They contain roughly 100 billion neurons with somewhere near 1 quadrillion connections and connections between them. Although they can be classified in unique types—according to function, structure, and other parameters—each neuron is completely unique. A single neuron may contain hundreds of synapses, or connections from other neurons and may also connect to dozens of others. At these synapses, neurotransmitters, or chemical messengers, open or close ion channels, portals through which ions such as sodium or calcium may pass. Opening and closing these channels has the effect of altering the electrical properties of the neuron, which is normally polarized with respect to its surroundings, typically resting at a slightly negative voltage. It is only after sufficient "stimulation" (de-polarization), that the neuron releases neurotransmitters at connections with other neurons. This is a gross simplification of the process—the number of different neurotransmitters and ion channels, together with their effects on different neurons produces myriad ways for "information" to be gathered, processed, analyzed, and stored—but serves to illustrate that computation in the brain is not a simple binary operation. Despite the temptation to look at the computational devices we create as mirrors of the brain, the reality is that they are vastly different in both their architecture and function. However, as a consequence of these machines having been built and designed by us, there are detectable fragments of our logic, language, and imagination embedded within.

The basic building blocks of our present day computing systems are junctions between two pieces of silicon with specially engineered properties. These junctions are used to build transistors, the simplest computational unit from which our most complex computer systems are built. A single transistor may contain a billion or more transistors, each functioning as a switch which is either on or off. Although transistors can be designed to provide a continuously variable output (as in analog electronics), here their function has been limited to provide an unambiguous two-state output. Two transistors combined may provide a continuously variable output, and that Boolean algebra, a system of mathematics represented through logical operators, is the substrate on which computer systems are built.

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Error, Noise, Glitch

The Art of the Algorithmic Unconscious

Phillip Stearns

This article is a meditation on the underlying substrate (the material) of artworks produced by human/machine collaborations where the uniqueness of the machine is an essential element, the “imaginative” or creative properties of its algorithms are vital in the completion of the artwork. The idea that the machine can function as a collaborator is based on the premise that human beings have embodied their thoughts, ideas, and abstract notions into these machines—that they are a kind of funny mirror where we see reflected a distorted image of ourselves central to the ideas presented within.
then opening the resulting file in an image viewing program. Rosa Menkman, in her book "A Vernacular of File Formats," demonstrates the potential of various data-bending techniques performed on a wide range of file formats. When these transformations are performed using standardized file formats, the results take on the signatures of the machine used in the transcription from one format to another. This forced rendering of "inconceivable" altered, corrupted, format inappropriate, or unmaskable data can reveal the architecture of the machine, the grail work of the algorithmic unconscious is revealed.

From Error to Noise: Mis-interpretations from the perspectives of machines has no meaning without the content of conventions devised by their human operators. Error is relevant only in the context of an intended purpose. To dive further into the nature of machine error (if we can even call it that anymore), here we turn to the introduction of noise—here taken to be anomalous or unallowed data.

The example in the opening paragraph illustrates one natural process capable of introducing noise into a digital system by changing the state of a bit from 0 to 1. What this means is that in a data set representing a bitmap image, the effect may be as subtle as changing slightly the color of a single pixel, or as drastic as corrupting the file in such a way that it is no longer recognizable as an image file; it’s all a matter of what that file’s function is. On the level of code, a change in the instruction set could cause any number of effect ranging from incomprehensible output to the entire system to grinding halt. What is important here is that errors do not appear as machine errors as such; at all, that is really happening are mathematical transformations, numbers acting as instructions on a black background. Anything that has been designed to detect and suppress anomalous output, return an error message, the logic gates are perfectly capable of shutting out bits as fast as they can be pumped in.

By designing a system built around two-state logic and numerical representation of information, the effect of interference and noise—random electronic variations introduced by thermal noise—on signal fidelity is minimized. In this sense, digital systems are by design anti-noise. In the shift from analog (or rather physical or chemical) forms of art making—where physical agents operated on physical materials—to digital, the inherent noise of physical material and its impact on signal quality is controlled and managed according to algorithms (mathematical operations). Anything that is to be generated or processed by a digital system must be represented in numerical form, even the program generating or processing the data. This does not mean that it can even be generated or processed by a digital system; it’s all a matter of what that file’s function is. The problem of compressing billions of transactions into arrangements that utilize the surface area of the silicon wafers out of which they’re made is nearly infinitely complex and an incredible challenge for human or computer alike to solve. The necessary collaboration between human and machine requires the development of more advanced digital technologies at the core of digital art making practices. As an algorithm becomes a metaphor for human thought encoded in language, we are seeing those machines with cruda, limited, and highly specific ideas in the form of sets of instructions and commands. In light of all this, McLuhan’s notion of technology being an extension of ourselves may not be far from the mark; though, far from being autonomous, our machines are dependent upon our survival for theirs. The algorithmic unconscious may not yet be something that we can clearly define or identify, however, we may be able to look at the products of digital art, circuit bending, and other related forms and identify between their ideas a revised metaphor for ourselves and our relationship to our technology and the environment.

This meditation has focused its attention on the material basis for the digital art making practices, touching upon the numerical systems of representation that are employed by digital technologies. In much the same way that structuralist film abandoned the conventions of cinema in the pursuit of working with the raw essence of the medium itself, this art and circuit bending—and other related practices which force digital systems to function outside their limitations—represents a return to the working with the material basis for artistic practice; it becomes possible to more concretely define the potential conceptual metaphors entailed by the application of specific techniques and processes. These techniques can be used to compose a situation that produces a physical effect on the viewer which reinforces the production meaning on the subjective level.

Notes:
LoVid is an interdisciplinary artist duo composed of Tali Hinkis and Kyle Lapidus. Our work includes live video installations, sculptures, digital prints, patchworks, media projects, performances, and video recordings. We combine many opposing elements in our work, contrasting hard electronics with soft patchworks, analog and digital, or handmade and machine produced objects. This multidirectional approach is also reflected in the content of our work: romantic and aggressive, wireless and wire-full. We are interested in the ways in which the human body and mind observe, process, and respond to both natural and technological environments, and in the preservation of data, signals, and memory.

486 Shorts stems from a personal interaction with an ordinarily closed-off part of a common machine. By getting inside the black box (the casing of an archaic 486 computer), LoVid reached the physical location where signals are passed. Connections were made on the circuit board of the video card, using wire to produce short circuits, and videos were produced from these short circuits. Recordings made from these shorts were then edited into 486 short clips, each corresponding to one of the physical shorts. (486 Shorts was recorded during a residency at iEAR in 2006. Special thanks to Bart Woodstrup, Douglas Repetto, Chris Jordan, Evan Rappaport, Ranjit Bhatnagar, and Lower East Side Ecology Center. A DVD release of 486 Shorts was published by Analogous Projects.)
Gijs Gieskes

Re-appropriating tools for new purposes, making inventive hardware projects, such as his Feedback video log, Strobo VJ machine or PCB hand painted circuit board, is what Gijs Gieskes enjoys most.

Artists and makers are re-inventing the design and function of ubiquitous consumer electronics devices by creating hybrid systems and artifacts with extended uses.

Educated as an industrial designer, he now casts Gameboy Bricks in concrete to build a garden path or a spinning photoelectronic acid machine. Gieskes’ work and live performances are a fantastic example of where hardware hacking can take you.

HSS3 Hypnothead

The Hypnothead is a character from the television series Futurama, it hypnotizes everyone that looks at it, by generating a drone sound and wobbling it’s eyes.

A Youtube user made a video loop of this Hypnothead, that is about 10 minutes long. The HSS3 Hypnothead is a hardware version of this Youtube video, that can run forever.

GVS1b

The GVS1b is a video sampler, that can be used to sample small clips of composite video and play them back in a grayscale depth of 1.5 bit.

In the exhibition setup there is a viewfinder used as a display, and a small security camera that films the person operating the GVS1b so the person can sample itself.
Benjamin Gaulon is a researcher, artist and has a broad experience of acting as art consultant, public and conference speaker and art college lecturer. His work focuses on planned obsolescence, consumerism and disposable society. He has previously released work under the name ‘recyclism’.

He is currently leading Data 2.0 (Dublin Art and Technology Association), he co-founded the IMOCA (Irish Museum of Contemporary) Art in 2007 and is lecturer at the National College of Art and Design in Dublin.

Since 2005 he has been leading workshops and giving lectures in Europe and US about e-waste and hardware Hacking / Recycling. Workshop participants explore the potential of obsolete technologies in a creative way and find new strategies for e-waste recycling.

His research seeks to establish an inter-disciplinary practice and collaborations by creating bridges between art, science and activism, and by doing so, shifting the boundaries between art, engineering and sustainable strategies.

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**AbstracTris**

Gameboy Screen, 9v Battery, Relay, Arduino, Servo.

AbstracTris is a LoTech generative pixel art device. The pixel are directly controlled by applying voltage to the side pins of the Gameboy LCD screen.

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**Corrupt**

This single-channel video is the collection of uploaded images on corrupt.recyclism.com since 2005. The video of 1:11:45 minutes includes 107,175 corrupted images uploaded by thousands of different people from 2005 to 2011. Each image uploaded and corrupted at corrupt.recyclism.com is unique - an individual story. However, once those 107,175 corrupted images are combined what emerges is a story, in a way, of the entire internet. "This video was made with the Corruptimator™" by Brian Solon.

Corruptimator™ is a bunch of Bash shell scripts loosely cobbled together in an attempt to simplify and automate the process of assembling a movie from five years’ worth of images generated by CORRUPT™.
In his research Karl Klomp focusses on live audiovisual expressions and interfacing. His work shows a fascination for glitch-art, hyperkinetic audio visuals and glitch grabbing. He deals with video circuit bending, frame grabbing, hardware interfacing, and max programming.

He also makes video hardware tools for other artists, and regularly gives audio/video circuit bending workshops, often in collaboration with Gijs Gieskes. He is theater technician for Toneelgroep Amsterdam.

Together with Tom Verbruggen (a.k.a. Toktek) he performs as VJ MNK and plays live AV-performances (toktek vs mnk).

The Minimal Camera is an object consisting out of an electronic circuit and hard cooper wires. A consumer wireless camera is decomposed and modified with cooper wires to enhance the feeling of complexity and fragility. By expanding the components of the circuit with cooper wires the electronic circuit becomes more tangible and understandable. Nothing on the original circuit board is added or omitted. The original was found at the market.

AV5-ERROR

The AV5-ERROR is a circuit bend video mixer which glitches live video input on audio signal. There are two busses that are circuit bend separately and reactive audio input from a microphone or line audio signal. The video RAM chips inside are extant with wires and can be selected on the extension box. With the potentiometer on the extension box the amount of audio can be adjust making the effect heavier or less reactive to audio.

This mixer is often used in live situations because of his stability in video sync. Circuit bending video always deals with the sync information in the video signal. This mixer is glitching the image before the sync signal so will always send out correct video signal to a projector.

Karl Klomp sells AV5E to artist, musicians and other people how need live video distortions. He’s the only company in the world that sells broken devices.
TokTek
aka Tom Vebrugen

TokTek is a Dutch artist who designs and deconstructs his own electronic instruments, giving his music a unique character and allowing him to improvise live on stage with the help of a joystick - the central piece in his live equipment.

Behind TokTek stands musician and visual artist Tom Verbruggen, who aside from building his own instruments is an improviser: synths, toys and computer become instruments. His eclectic electronic style has been described as illogical hardware bending, where the outcome creates dramatic live compositions, which break down into delicate and tender sound moments.

In one of his incarnations, he performs with VJ MNK (Karl Klomp) - a video artist that hacks/bends video equipment like videomixers.

Crackle-canvas

A Crackle-canvas is a painting that produces sound. It contains a circuitboard, speaker, knobs, switches, wood and canvas. Each one makes sounds by itself but can be connected through cables (patched) with other Crackle-canvasses. This way the paintings start to react on each other. Each patch creates a different sound and drawing of cables on the wall or in the space the paintings are presented.
Every technology possess its own inherent accidents.

ROSSA MENKMAN is a Dutch visualist who focuses on visual artifacts created by accidents in digital media. The visuals she makes are the result of glitches, compressions, feedback and other forms of noise. Although many people perceive these accidents as negative experiences, Rosa emphasizes their positive consequences.

By combining both her practical as well as her academic background, she merges her abstract pieces within a grand theory artifacts (a glitch studies). Besides the creation of a formal "Vernacular of File Formats", within her static work, she also creates (narrative) work in her Acousmatic Videoscapes. In these Videoscapes she strives to connect both sound and video artifacts conceptually, technically and sometimes narratively.
In the “Practice of Everyday Life” Michel de Certeau investigates the ways in which users—commonly assumed to be passive and guided by established rules—operate. He asserts: “This goal will be achieved if everyday practices, “ways of operating” or doing things, no longer appear as merely obscure background of social activity, and if a body of theoretical questions, methods, categories, and perspectives, by penetrating this obscurity, make it possible to articulate them.”

“ReFunct Media” is a multimedia installation that (re)uses numerous “obsolete” electronic devices (digital and analogue media players and receivers). Those devices are hacked, misused and combined into a large and complex chain of elements. To use an ecological analogy they “interact” in different symbiotic relationships such as mutualism, parasitism and commensalism.

Voluntarily complex and unstable, “ReFunct Media” isn’t proposing answers to the questions raised by e-waste, planned obsolescence and sustainable design strategies. Rather, as an installation it experiments and explores unchallenged possibilities of ‘obsolete’ electronic and digital media technologies and our relationship with technologies and consumption.