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Recycling old strategies and devices

What remains, an art project addressing disinformation campaigns (re)using strategies to delay industry regulation

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Abstract

This paper describes a research-based art project that seeks to identify several strategies used to delay industry regulation and manipulate public opinion during the 1980s and compare them to the strategies used by online advertising platforms such as Google and Facebook which are facing regulation today. This paper will show how these strategies have been woven into the story of a game called *What remains*, a darkly humorous, authentic Nintendo Entertainment System (NES) game aiming to create an experience of fighting misinformation, showing the player ways to push back and regain agency by joining forces with others and actively questioning the nature of different news media.

Throughout the nineteen eighties, several strategies were tried and tested to manipulate public opinion in order to avoid regulation that was threatening industries such as oil and tobacco. Three strategies will be discussed with examples from the 1980s as well as from today's Tech Industry, which is facing potential regulation after the 2016 US elections and the Brexit referendum made it clear that there was a massive lack of accountability on the part of online advertising platforms. The November 2017 congressional hearings of Facebook, Twitter and Google, as well as the hearings of Marc Zuckerberg in the US and the EU in early 2018 are the main sources of information analyzed.

This paper describes an art project that shows some of the most successful pre-internet disinformation campaigns and highlights how the online advertisement industry is utilizing them to stave off regulations threatening their business model, even if their business model is threatening democracy.

Keywords

artistic practices, digital countercultures, digital art and technologies, cultural Studies, journalism

What remains, un proyecto artístico que trata sobre las campañas de desinformación (re)utilizando estrategias para retrasar la regulación industrial

Resumen

Este artículo describe un proyecto artístico basado en la investigación que busca identificar varias estrategias empleadas para retrasar la regulación industrial y manipular a la opinión pública durante la década de 1980, y compararlas con las estrategias usadas por plataformas de publicidad en línea como Google y Facebook, que afrontan la regulación actual. El artículo mostrará cómo estas estrategias han hilado la historia de un juego llamado What remains, auténtico de Nintendo Entertainment System (NES), con un humor oscuro que pretende crear una experiencia de lucha contra la desinformación, mostrando al jugador formas de retroceder y recuperar la voluntad aunando fuerzas con otros para cuestionar activamente la naturaleza de distintos medios informativos.

Durante la década de 1980, se intentaron y probaron varias estrategias para manipular a la opinión pública con el fin de evitar que la regulación amenazara a industrias como las del petróleo y el tabaco. Se analizarán tres estrategias con ejemplos de los años ochenta y también de la industria tecnológica de hoy, que está haciendo frente a una regulación potencial tras las elecciones de los EE. UU. en 2016 y el referéndum del Brexit, que ha hecho evidente la falta masiva de responsabilidad por parte de las plataformas de publicidad en línea. Las fuentes de información principales que se han analizado son las vistas en el Congreso de Facebook, Twitter y Google en noviembre de 2017, y las vistas de Mark Zuckerberg en los EE. UU. y en la UE a principios de 2018.

Este artículo describe un proyecto artístico que muestra algunas de las campañas de desinformación más exitosas antes de internet y resalta que la industria de la publicidad en línea se sirve de ellas para prevenir las regulaciones que amenazan su modelo de negocio, incluso si este modelo amenaza la democracia.

Palabras clave

prácticas artísticas, contraculturas digitales, arte y tecnología digitales, estudios culturales, periodismo

Introduction

This paper describes the artistic project *What remains*, an 8-bit game for the emblematic 1985 Nintendo Entertainment System (NES), which blends visual novel and adventure elements into a story that translates real events from the 1980s into an epic quest to save the world. The game lets you experience a fight against disinformation, showing you several ways to push back and regain agency by joining forces with others and actively interrogating the nature of different news media. The project is set in the 1980s, the decade in which many of the problems we face today became painfully apparent. The collateral damage of industrial capitalism – acid rain, the hole in the ozone layer, global warming – became visible at the same time as the rise of neoliberalism with its push for deregulation. The game is based on research that identifies several strategies used to delay industry regulation during the 1980s and this paper compares those to the strategies used by online advertising platforms such as Google and Facebook facing regulation today. I conducted a literature review and identified three key disinformation campaigns described in *Merchants of Doubt* (Oreskes and Conway 2010), *Requiem for a Species* (Hamilton 2010) and the *Oxford Handbook of Climate Change* (Dunlap and McCright 2011).¹ I collected documents bearing witness to these strategies, from online databases such as the Industry Documents Library.²

For each strategy I will give an example from the 1980s, explain how this strategy is currently used by online advertising platforms and how it has been translated into the game's story.

This paper does not propose that games or art are the best medium to combat disinformation or to make people immune to the effects of it. This paper describes an art project that shows some of the most successful pre-internet disinformation campaigns and highlights how the online advertisement industry is using them to stave off regulations. The text describes *What remains* and its underlying research in order to demonstrate how art can use a medium intended for entertainment to address a complex topic with an audience outside the white cube and academia. It is a study of artistic research finding its way into a narrative and physical form that is in line with its conceptual underpinnings. Therefore it is important to involve descriptions of the game, next to the exploration of the different strategies at the base of its narrative. It is outside of the scope of this paper to discuss the choices made within the translation process itself, from historical events to the stages in the game, as this would not leave enough room to analyze and compare the strategies. At this moment no research has been conducted on the effects of the game on its audience. During the development of the project several playtests were held that gave insight into how the game was received in its early stages, but no tests have taken place after completion.



Fig. 1. Still from *What remains*, "Title Screen". Hoorn: Iodine Dynamics.



Fig. 2. Still from *What remains*, "Wow a new NES game!". Hoorn: Iodine Dynamics.

1. In *The Age of Surveillance Capitalism* (2019, 122), Shoshana Zuboff identifies four strategies protecting the online advertising industry from political and public scrutiny: showing the technical capability to get a competitive advantage during elections; a deliberate blurring of public and private interests through aggressive lobbying; a revolving door of people professionally moving between Google and the Obama administration and Google's intentional campaign to influence academic work and thus influence policy formation and public opinion. Studying Oreskes and Conway's *Merchants of Doubt* (2010), Hamilton's *Requiem for a Species* (2010) and *Organized Climate Change Denial* (Dunlap and McCright 2011), I identified 10 strategies (de Valk 2017). In this paper, I chose to limit myself to the three strategies most prominently represented during the November 2017 congressional hearings of Facebook, Twitter and Google, as well as the Marc Zuckerberg hearings in the US and the EU in early 2018.

2. The archives I have consulted are UCSF's Industry Documents Library, the Center for International Environmental Law's Smoke and Fumes, Greenpeace's PolluterWatch Coal Ads Archive and Exxonsecrets.org, Phillip Morris USA's Public Document Site, Union of Concerned Scientists' The Climate Deception Dossiers, Climate Investigations Center's Climate Files and the Center for Media and Democracy's SourceWatch.

What remains is made for the original 1985 NES, a 30-year-old device repurposed for creative expression, which functions as a symbol of that time's influence on the present. The game is released on original, recycled cartridges as well as online as a freely downloadable ROM playable on any NES emulator.³ The game is a project by Arnaud Guillon, Chun Lee, Dustin Long, Aymeric Mansoux and myself and was released on September 27, 2018. The game has a female protagonist, Jennifer, who stumbles upon a NES cartridge which contains encrypted documents. She and her best friend Michael start to unravel a conspiracy threatening the whole planet by decoding the documents, and start spreading news about the information they discover. The game allows the player to actively engage with the topic of disinformation instead of merely read about it. This approach was inspired by research using a game to inoculate people against fake news (Roozenbeek and van der Linden 2018). This pilot study used a multi-player game that invited players to actively create a misleading news article. Although exploratory, the study found that through exposure to, and active engagement with, small amounts of misinformation, participants' ability to recognize and resist fake news and propaganda improved (*ibid.*).

Before delving into the strategies, I would like to briefly describe the attempts at creating legislation since 2016, the year in which the political impact of online advertising platforms finally hit Europe and the US (Allcott and Gentzkow 2017; Marwick and Lewis 2017). The European Commission asked online advertisers to self-regulate (European Commission 2018). The GDPR took effect but the EU is still waiting for the ePrivacy regulation, complementing the GDPR with rules covering tracking technologies, profiling and behavioral advertising. While this regulation has been delayed by frantic lobbying and the reluctance of the Austrian presidency of the EU Council to make this a priority (Corporate Europe Observatory 2018), the US has seen several congressional hearings, yet is still waiting for improved data protection laws, greater transparency in online advertisements and stricter enactment of anti-trust laws. Examples of the industry's harmful effects are rapidly piling up, the Russian interference in the 2016 US presidential elections (Prier 2017), the Facebook and Cambridge Analytica scandal (Cadwalladr 2017) and the incitement of hate against the Rohingya on Facebook to name but a few (United Nations Human Rights Council 2018). At the time of writing, pivotal elections are nearing, including the 2019 European parliament and the 2020 US presidential elections. How has the tech industry succeeded in delaying regulation so far?

#1 Controlling the narrative

The first strategy used to delay regulation is the aggressive distribution of a self-constructed narrative. The most striking example of this strategy in the 1980s is the use of PR agency Katzenstein Associates by both the Edison Electric Institute (EEI) and the Tobacco Institute (Oreskes and Conway 2010). EEI published an advertisement in the *Washington Post* in 1982 called: "Acid rain, the real issue is whether you have all the facts" (EEI 1982). The ad contained a coupon to order the booklet "An Updated Perspective on Acid Rain" written by Alan Katzenstein (1981). The booklet contained falsehoods such as acid rain having a fertilizing effect and an explanation of pH values explaining that acidity is not all harmful, since tomatoes and carrots

Display Ad 38 -- No Title
The Washington Post (1974-Current file); Feb 3, 1982;
ProQuest Historical Newspapers: The Washington Post (1877-1994)
pg. C8

Advertisement

Acid rain.
The real issue is whether you have all the facts.

Acid rain implies danger. It's become an issue clouded by confusion, misguided blame and misplaced hope. Undoubtedly, that's because most people have been inundated with one-sided stories that acid rain is strictly a man-made problem which threatens our environment.

Right now, on the basis of incomplete and often frightening reports, people are proposing that legislation be enacted and drastic steps be taken to stop what they believe to be the cause of acid rain.

What is causing acid rain?

While it's easy to draw conclusions from the circumstantial evidence, new facts and new interpretations are shaping a better understanding of acid rain and acidity in the environment.

We believe it is virtually impossible to enact sensible legislation until these, and all the facts, are considered.

Information, free discussion, before legislation.

We want you to know all the facts, scientific, environmental and economic, as well as what can be done and what is being done about this highly complex and controversial issue. So we've put together a booklet entitled "An Updated Perspective on Acid Rain."

Call 800-526-7443, Ext. 333 for a free updated fact book.

For your free copy, call toll free 800-526-7443, Ext. 333.
(In N.J., 800-522-4503, Ext. 333.)
Or return the coupon below.

Do it now. Because acid rain is too important an issue to make a decision about without having all the facts.

I want the facts. Please send me "An Updated Perspective on Acid Rain."
Name _____
Address _____
City _____
State _____ Zip _____

Send to: Acid Rain Facts, P.O. Box 5004,
Clifton, New Jersey 07015.

Edison Electric Institute
The association of electric companies
Washington, D.C. 20038

WAP2

Fig. 3. Edison Electric Institute advertisement in *The Washington Post*, 3 February 1982. *Acid rain, the real issue is whether you have all the facts.* Available at: <http://polluterwatch.com/coal-ads-archive>. [Accessed: 16-10-2018]

3. The game can be downloaded at <https://iodinedynamics.itch.io/whatremains>.

are acidic as well: “all have pH values well in the range of the rain that is the subject of scare headlines in the popular media” (Katzenstein 1981). In 1987 Katzenstein wrote “Environmental Tobacco Smoke and Risk of Lung Cancer, how convincing is the evidence?” for the Tobacco Institute. He went on a media tour that year, giving 62 TV, radio and newspaper interviews in which he was presented as an air quality expert (Halperin 2013).

Compared to this, the online advertising industry has it easy; it *owns* the channels that inform more and more people (Reuters Institute for the Study of Journalism 2018). Even though news consumption via Facebook is on the decline, news consumption via messaging apps is rising (*ibid.*). To capitalize on this, Facebook has announced it intends to merge Facebook Messenger, Instagram and WhatsApp under the guise of improved privacy, yet plans to build functionality on top such as... advertising (Zuckerberg 2019). The online advertising industry has carefully constructed a narrative using a very fluid identity and can use its own channels to distribute it. Its business model relies on two distinct identities: online advertising platform when facing businesses and social media or search engine when addressing users (Zuboff 2019). When facing public scrutiny, more identities surface. During the 2nd day of the US congressional hearings with Marc Zuckerberg in April 2018, Senator Dan Sullivan asked Mr. Zuckerberg whether he thinks Facebook is the world’s biggest publisher or a tech company given that Facebook takes full responsibility for published content (Sullivan 2018). If it is considered a neutral tech platform, it has legal immunity under Section 230 of the Communications Decency Act in the US. In a court case by Six4Three against Facebook on the other hand, Facebook claimed that it is a publisher for first amendment purposes, free to censor and alter the content it publishes (Six4Three v Facebook 2018). So which one is it? The online advertising industry has a very fluid identity and uses this to remain unaccountable for the effects of its business model.



Fig. 4. Still from *What remains*, “The newspaper is owned by DNYcorp?”. Hoorn: Iodine Dynamics.

In the game, you learn about Alan Kittenstein of the PR agency Kittenstein and Associates. He has been hired by DNYcorp whose energy branch is worried about acid rain causing panic among the public. You also discover that the local newspaper, the Sunny Peaks Gazette, is owned by Fred Robafeller, who owns 80 % of DNYCorp, the corporation wreaking havoc on the environment in your hometown. You gain the ability to spread the information you received by literally blowing the whistle. When you do, you inform other characters in the game of what you have just learned, with each responding differently to your news. Some are convinced, others accuse you of being a doom crying opponent of all progress (Lee Ray and Guzzo 1990). This stage of the game is won by winning the trust of a group of people that run a pirate radio station who let you broadcast a story about the economic interests and corporate entanglements of the Sunny Peaks Gazette. Should this strategy fail, what else can be done to stay unregulated?



Fig. 5. Still from *What remains*, “Panic is not good for docile consumerism”. Hoorn: Iodine Dynamics.

#2 Appear to be fighting for the people, while letting the people fight for you.

The second strategy is to appear to fight for and with the people, by using front groups and astroturf campaigns. This creates the illusion of many different groups fighting for the same cause: usually individual freedom made to look indistinguishable from the corporate freedom not to be regulated or taxed. Citizens for a Sound Economy (CSE), an anti-tax think tank dedicated to promoting free market economics, was co-founded in 1984 by David Koch, of Koch Industries, and Richard Fink. Although it profiled itself as a grassroots movement, with the slogan: “Americans fighting for lower taxes, less government and more freedom” (Citizens for a Sound Economy 2002), it was funded by the tobacco, oil, energy and sugar industries (Fallin, Grana and Glantz 2014). CSE split into Americans For Prosperity and

FreedomWorks in 2004. In 2002 CSE launched the Tea Party website. The Tea Party is a grass roots uprising for freedom, choice, lower taxes and less government regulation, a mobilization of well-meaning, concerned citizens who thought they were fighting elite power, yet the protests were orchestrated by that same elite (Monbiot 2010; Fallin, Grana and Glantz, 2014). The Tea Party turned out to be an astroturf campaign, hiding its sponsors until 2012 when internal FreedomWorks documents leaked (Kroll 2013).

A similar approach was used four years after the CSE was founded, with a much more profound impact. In 1988 Citizens United was founded, again profiling as a grassroots conservative political advocacy group “dedicated to restoring our government to citizens’ control” (Citizens United 2018), acting as a group of concerned citizens, but funded by among others the Koch brothers (Mayer 2017). What started in the 1980s, led to the 2010 Citizens United case against the FEC, resulting in the ruling that the free speech clause in the first amendment prohibits the government from restricting expenditures for political communications by among others corporations and non-profits. This made it possible for the now famous super PACs, and billionaire donors, such as the Koch and Mercer families, to have massive influence on politics (*ibid.*). Citizens United’s focus on free speech and appealing to protecting individual freedom in order to defend a corporate agenda is echoed by the campaigns of the online advertising industry to delay regulation.



Fig. 6. Screenshot of the Citizens United Website, 2018. Available at: <http://www.citizensunited.org>. [Accessed: 24-05-2018]

Online advertisers do not only appear to be fighting for free speech, but in this fight choose to ignore the right to privacy, the right to equality and freedom from discrimination that need to be taken into account in order to protect people when free speech is used to incite hate and violence against them. During the October 2017 US congressional hearings, Randal Rothenberg, CEO of the Interactive Advertisement Bureau, a lobby group which includes all major online advertisers as, while pitching self-regulation against the proposed Honest Ads Act, said: “robust political speech – no matter who is paying for it, no matter how controversial it is, no matter who may be offering

it – is the essence of American democracy, and must not be stifled” (Rothenberg 2017, 5). Individuals’ freedom of expression is not what is at stake here though; it is accountability for an industry’s impact on society. This problem cannot be fixed focusing only on the user-facing side of these platforms, for instance with regulation aimed at increasing transparency in online advertising, while the business model – creating a monopoly (Fuchs 2018, 11-19; Zuboff 2019, 132-138), making people and smaller businesses dependent on services that are meant to harvest behavioral data used for psychological profiling and exerting unconscious influence and putting this influence on the market (Zuboff 2019, 93-328; Kramer, Guillory and Hancock 2014) – is the problem.

Inspired by the Koch brothers’ efforts to bootstrap the Tea Party protests, the elections for a new mayor for Sunny Peaks in the game are hit by an anti-tax, pro-freedom, astroturf campaign organized by DNYcorp to get the industry-friendly mayor John Donson elected. You receive information about the scheme and need to convince as many people as possible not to fall for the campaign. You try talking to them about the evidence you have uncovered, but the campaign uses slander against you. You have lost trust. Discrediting news sources, individual journalists and politicians has always been a very effective strategy, it disqualifies the content of any message made public because it is the very source itself that is untrustworthy. Even though you have evidence, you cannot win this battle. Only after uncovering a plan by DNYcorp that threatens the whole world, publishing your discoveries via independent press, radio and television, and infiltrating the secret headquarters of DNYcorp are you able to stop the spread of false information. DNYcorp defends itself with one last strategy.



Fig. 7. Still from *What Remains*. “No more nanny city council! Free markets, free citizens!”. Hoorn: Iodine Dynamics.

#3 Distract!

The last strategy is all about distracting the public's attention by putting forward research that invalidates a concern or points to something even more concerning that is unrelated to the industry in question. This strategy has three steps. First the focus is entirely placed on a larger problem than the one the industry causes. During the 1980s this problem was still communism, which later turned into environmentalism and more recently terrorism and other foreign threats (Oreskes and Conway 2010). Step two consists of offering a technological solution to the problem (*ibid.*, 174-183). Step three is there in case step one and two fail: you stress how people can adapt to the problem you caused (*ibid.*). During the 1980s the Cold War was still used as a distraction to push through policies that were a direct threat to public safety, such as the Strategic Defense Initiative (SDI), Reagan's thankfully never realized plan to protect the US against Soviet nuclear missiles with a laser defense shield in space (Lepore 2017). The lobby campaign in defense of SDI turned into a full-fledged attack on science (Oreskes and Conway 2010), as exemplified by Russel Seitz's 1986 paper *In from the Cold: Nuclear Winter Melts Down* (Seitz 1986). In the paper the author completely dismisses the 1983 paper *Nuclear Winter: Global Consequences of Multiple Nuclear Explosions* (Turco et al. 1983), as a politicization of science.

To draw attention away from the problems caused by their business model, the testimonies during the November 2017 Twitter, Facebook

and Google hearings focused on the foreign threat, the assault on democracy: "Our country now faces a new type of national cybersecurity threat – one that will require a new level of investment and cooperation across our society" (Stretch 2017). Foreign interference is not new though, neither is the domestic manipulation of political discourse, what is new is the infrastructure put in place by online advertising platforms greatly facilitating this interference (Marwick and Lewis 2017). Step two of the strategy, the technological solution, is found in AI and machine learning. Twitter will make efforts "to invest even further in machine-learning capabilities" (Edgett 2017) and Facebook has already built "more advanced AI tools to remove fake accounts more generally" (Zuckerberg 2018). Step three, where people adapt to the problem, is rather ironic – we are told we need to educate ourselves and learn to detect when we are subconsciously manipulated. Jean Edgett states: "Enhancing media literacy is critical to ensuring that voters can discern which sources of information have integrity and which may be suspect" (Edgett 2017).



Fig. 8. Strategic Defense Initiative logo, United States Missile Defense Agency, 1983. Available at: https://en.wikipedia.org/wiki/Strategic_Defense_Initiative#/media/File:Sdilog.svg. [Accessed: 15-03-2019]



Fig. 9. Still from *What remains*, "They are going to geoengineer a cooling blanket of soot and dust particles...". Hoorn: Iodine Dynamics.

In the game DNYCorp is distracting people with an epic yet fake alien invasion. The solution they propose is to attack the aliens with nuclear weapons. This will, not coincidentally, generate a nuclear winter, cooling the earth, neutralizing the effects of global warming so people can continue to burn the fossil fuels offered by DNYCorp. The company proposes a technical solution – geoengineering – using the nuclear winter theory, while simultaneously distracting from the cause of the problem. This part of the game is based on the same paper Russell Seitz attacked to defend Reagan's SDI. The TTAPS paper, named after its authors, drew attention to the second order effects of a nuclear attack, the dramatic drop in Earth's surface temperature for a period of weeks to months due to atmospheric dust, causing crop failure (Turco et al. 1983). The infrastructure put in place to promote

the SDI and discredit this paper is now used to undermine effective action against global warming (Lepore 2017).

Conclusion

Throughout this paper we have seen three strategies used by industries to delay regulations that could harm their business, and how they have been translated into a game that lets players discover and resist them. The game lets players fight for independent media, destroying the carefully constructed narrative of a harmful industry. It lets you discover an astroturf campaign to get an industry-friendly politician elected, and lets you experience how protesters' anger against the 1% is used against them, and how powerless you are in the face of slander. The game has an epic ending involving an ambitious attempt at distracting the public with an alien invasion. The game takes place in a pre-internet era yet the strategies used to influence public opinion and delay industry regulation have not evolved that much. The infrastructure used to carry out those strategies has though, and this has made wielding influence much easier (Kramer, Guillory and Hancock 2014; Marwick and Lewis 2017; Prier 2017).

The mission statements of Big Tech are mind blowing. Google wants "to organize the world's information and make it universally accessible and useful" (Walker 2017). Twitter aims "to foster and facilitate free and open democratic debate and promote positive change in the world" (Edgett 2017) and Facebook wants "to create technology that gives people the power to build community and bring the world closer together" (Stretch 2017). Those missions address a strong and empowered user, and make Google, Facebook and Twitter come across as almost philanthropic. Yet those statements stay silent about their business-facing side, which addresses another type of user: emotional, easy to manipulate and in need of nudging (Zuboff 2019). This carefully constructed narrative, in which online advertising platforms are framed as promoting democracy and free speech, uses a split identity to stave off public scrutiny.

During the 2017 hearings of Facebook, Google and Twitter distraction ruled – the emphasis was on fighting a foreign threat. AI and machine learning were brought forward as a big part of the solution to battle this evil, next to the public needing to educate itself so they know when they are being manipulated. People are asked to adapt while platforms steer clear of responsibility. Yet as David Carroll, the US professor that sued Cambridge Analytica to obtain access to his information in the UK, said in an interview with the Guardian, in response to a data leak by Google potentially affecting 500,000 accounts: "Google is right to be concerned and the shutdown of Google+ shows how disposable things really are in the face of accountability" (Wong and Solon 2018).

For a democracy to work, we need informed, not misinformed citizens (Kuklinsky et al. 2000) who understand what is at stake in decision-making processes (Pasquale 2015). For that we need

both access to trustworthy sources of information and trust in the capacity of people to inform themselves. It is important to continue to negotiate a balance between freedom of expression and freedom from discrimination, a recurring theme in political theory since World War II. It is best not to leave finding this balance, an approach to the tolerance paradox (Popper, 1945), to publicly traded online advertising platforms. The financial stakes in these platforms will not prove helpful (Zuboff 2019, 93-97; Pasquale 2015, 59-101). *What remains* is a game that explores these issues and lets you experience the different parallels between disinformation campaigns in the 1980s and today through the lens of a game console from that decade.

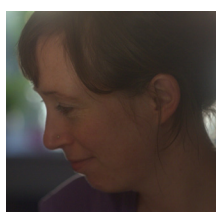
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She has participated in exhibitions internationally, teaches workshops, gives lectures (among others at Transmediale and Chaos Communication Congress) and has published articles on Free/Libre/Open Source Software, free culture, art and technology (among others in the *Contemporary Music Review*, *Archive 2020*, *Pervasive Labour Union Zine* and *NXS*). She is a thesis supervisor in the Master's Program in Experimental Publishing at Piet Zwart Institute and a fellow at V2_Lab for the Unstable Media. She is a former member of artist collective GOTO10, has helped develop the puredyne GNU/Linux distribution and Make Art festival. She is co-editor of the Digital Artists' Handbook and the publication FLOSS+Art, published in early 2009. She is part of Plutonian Corp, La Société Anonyme and lodyne dynamics.

