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MACHINE RESEARCH
A PEER-REVIEWED NEWSPAPER
VOLUME 6
ISSUE 1
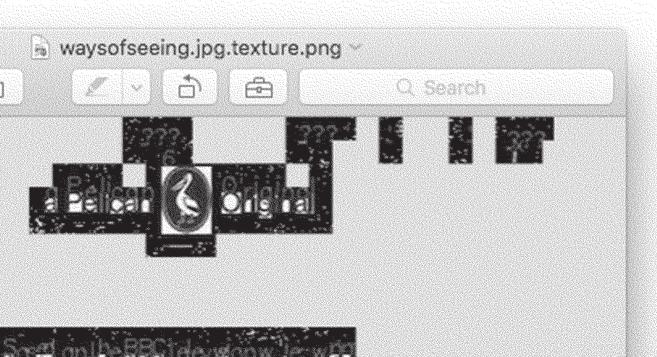### 2017
FREE

Through the production of re
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1000-paper-publication-2.txt

From the satellite, where the scale of the transformations of the
is visible, images of the agricultural plans show how a portion o
brought materially to behave topologically, displaying how vast t
turned into a productive regime thanks to the connection to huge
These are pictures that look in fact like a thermodynamic diagram
inner workings of an abstract machine. Coincidentally, during the
the 20th century, and after the chemical industries had ended up
nitrogen to fuel the productivity of yields, a thermodynamic stan
applied to the Biosphere, the uppermost living layer of the plane
Russian mineralogist Vladimir Vernadsky or the American mathemati
introduced the biochemistry of the soil itself as an addi

interviewwithanetherbox.txt

dme
box" is the name of a configuration of software and hardware that was i
the Machine Research workshop. Speaking "in" and "from" the situation,
rm was used to write the Questions and Answers of this interview collec
November 2016.

waysofseeing.jpg.texture.png

Search

MACHINE RESEARCH

INTRODUCTION

This publication is about Machine Research - research on machines, research with machines, and research as a machine. It thus explores machinic perspectives to suggest a situation where the humanities are put into a critical perspective by machine driven ecologies, ontologies and epistemologies of thinking and acting. It aims to engage research and artistic practice that takes into account the new materialist conditions, implied by nonhuman techno-ecologies. These include new ontologies and intelligence such as algorithmic learning, histories of machine intelligence and legacy technologies, ethics and aesthetics of autonomous systems and other post-anthropocentric reconsiderations of agency, materiality and autonomy.

The articles address these topics using writing machines that enhance our reading and reflections on the ways in which research has become machine-like, following tired protocols and mechanisms that are bound up with the reputation economy and the profiteering of publishing companies that charge huge amounts of money to release texts under restrictve conditions. In this way, the publication also functions as a response to the machinery of academic print.
If new production modes have disrupted other types of publications (of music, movies, etc.), academic print in many ways remains unaffected and is largely controlled by a number of corporate publishers that are subsidized by university libraries. Whereas open access presents itself as an alternative, we ask whether disruption is not also dependent on challenging the very system of accreditation that nurtures academic publishing. This publication and the process leading to it are proposed as an alternative publishing machine in line with this thinking.

We are also conscious of the difficulty of developing various critiques without reflecting upon our production process in terms of the challenges of temporary collectivity, shared responsibility, and the ways in which various hierarchies are both undermined as well as confirmed in group work. Our open process in this sense becomes bound up in its own rhetoric and yet another mechanism or machine of power, despite the wish to think and do otherwise.

The publication results from a three-day workshop held in October in Brussels, hosted by Constant at the Brussels World Trade Center. Using Free, Libre and Open Source collaboration tools, participants experimented with collective notetaking using etherbox and ways to transform their contributions through the intervention of a set of scripts that each addressed different aspects of machinic authoring. The design and layout of this publication are the result of a next step in the process, taken by Sarah Garcin, using her publishing tool, the PJ machine.

The workshop and publication also contribute to the transmediale festival programme for 2017 that focuses on the elusive character of media and technological change and how it is articulated in the contemporary and elusive moment of messy ecologies of the human and non human. Since 2011, Aarhus University and transmediale festival for digital art & culture have organised research workshops of this kind, as part of an ongoing collaboration with shifting partner organizations (Universität der Künste ("In/Compatible Research", Berlin, 2011); Leuphana University of Lüneburg ("Researching #BWPWAP", Lüneburg, 2012); Kunsthal Aarhus ("Post-digital Research", Aarhus, 2013); School of Creative Media, City University Hong Kong ("Datafied Research", Hong Kong, 2014); Liverpool John Moores University and Liverpool Biennial ("Excessive Research", Liverpool, 2015). Each of these workshops has applied a research angle to the thematic framework of transmediale, and with an open call for participation they have also sought to open the festival up to emerging academic and/or practice-oriented researchers. The outcomes have, as an experiment in new forms of scholarly publication, been presented in a series of peer-reviewed newspapers, as well as in an open access online academic journal, APRJA (A Peer-reviewed Journal About). This newspaper presents the latest outcomes of a workshop organised in partnership with Constant Association for Art & Media.

Machine Research, the latest issue of the open access online journal APRJA is available at http://www.aprja.net/?page_id=3132 (Proximus NV ⇻ NORDUnet ⇻ RIPE Network Coordination Centre)

List of contributors

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Thanks to Seda Gürses, Antoinette Rouvroy,
Silvia Mollicchi, Caspar Menkman, Valentina Vuksic,
Dave Young, Daphne Dragona and Kristoffer Gansing.

THE PJ MACHINE

The Machine Research Publication has been made entirely with the PJ
Machine, a live publishing tool. In analogy to Dj'ing and VJ'ing, PJ'ing is
a way to make publications on the fly. The machine with the colored
arcade buttons is connected to folders full of texts and images.
By hitting the buttons, you compose your own page.

The PJ Machine

=

a physical box

+

a digital interface

Blue buttons -> change the content and select the block you want to act on
Red buttons -> Zoom In / Zoom out
Left white button -> Change the block width
Yellow buttons -> Move the block
Dark buttons -> increase / decrease word spacing
Right white button -> Highlight specific words
Green button -> Export your page in pdf

Readme

This is a script that estimates the similarity between documents that are taken two by two from a larger collection. The algorithm calculates the average frequencies of the words used within the collection of all the documents, and compares these values with the local frequencies of the words within each document individually. The deviations / fluctuations become then the parameters used to calculate a quantitative value of semantic proximity.

More information:
http://scikit-learn.org/stable/modules/feature_extraction.html#text-feature-extraction (Proximus NV ↠ Level 3 Communications, Inc. ↠ GitHub, Inc.)

The calculations of the # word count of papers is based on work-in-progress versions of articles produced for the workshop.
See https://machineresearch.wordpress.com/

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FEATURE EXTRACTION: MOST FREQUENT WORDS

An_Ethnography_of_Error.txt
-- error(13) human(12) problem(11) driverless(9) car(9)

Computing_War_Narratives_The_Hamlet_Evaluation_System_in_Vietman.txt
-- hamlet(22) hes(20) data(16) war(12) vietnam(12)

Elusive_Borders_Aesthetic_Perpectualization_The_Space_Time_of_Metadata.txt
-- space(21) data(18) cables(15) metadata(14) tor(12)

From_Page_Rank_to_Rankbrain.txt
-- search(28) google(22) page(17) users(13) algorithms(11)

Machine_Listening.txt
-- human(28) wavenet(22) ernst(18) machine(16) listening(16)

Machine_Pedagogies.txt
-- images(16) human(15) freire(15) oppressor(13) learning(13)

Participation_in_Infrastructures.txt
-- systems(20) electricity(19) demand(13) time(12) resources(11)

Pattern-Recognition-across-Bodies-and-Machines-by-Anarchival-Means.txt
-- data(26) recognition(11) digital(11) capture(11) perception(9)

Relearn_to_Read_Speed_Readers.txt
-- reading(39) speed(35) reader(13) readers(12) new(12)

Resolution_Theory.txt
-- resolution(66) term(17) word(15) resolutions(15) formal(14)

Testing_Texting_South_a_Political_Fiction.txt
-- language(18) south(17) political(17) fictions(13) 2015(11)

The_Cultural_Politics_of_Information_and_of_Debt.txt
-- information(20) debt(19) communication(19) terranova(15) message(14)

The_Signification_Communication_Question_Some_Initial_Remarks.txt
-- language(14) communication(14) reality(11) thought(10) medium(10)

The_Stupid_Network_that_we_Know_and_Love.txt
-- network(21) ip(15) tcp(13) internet(13) protocol(12)

Unmaking_Screens_a_Genealogy_of_the_Mineral_Vision.txt
-- vision(13) media(11) land(10) earth(10) practices(7)

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CALCULATED SIMILARITY VALUE BETWEEN DOCUMENTS

An_Ethnography_of_Error.txt
-- 0.088 Machine_Pedagogies.txt
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RECOMMENDED READINGS FLOW

If you enjoyed reading An_Ethnography_of_Error.txt, you might like also:
-- Machine_Pedagogies.txt
-- Machine_Listening.txt

If you enjoyed reading Computing_War_Narratives_The_Hamlet_Evaluation_System_in_Vietman.txt, you might like also:
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UNMAKING SCREENS. A GENEALOGY OF THE MINERAL VISION✼

Abelardo Gil-Fournier

During three decades, from 1939 to 1973, the Spanish National Institute of Colonization repurposed enormous extensions of territory linked to the engineering of large-scale water infrastructures. As a consequence of this agrarian reform and land settlement program of Franco's dictatorship, agriculture in Spain started to be industrialized, thanks to the outcomes of chemical industries and the disposal of cheap human workforce. Significantly, this technification, exploitation and population of land coincided with the first series of aerial orthophotographic pictures mapping the whole Spanish territory. As a result, soil became an engineered surface to hold and transform solar light energy into cereals, fruits and vegetables, while at the same time the reflected sunlight became gradually a source of information stored in photographic plates carried on by aircrafts owned by military and cartographic institutes.

This mediated transformation of the ground belongs to the broader observation of the earth through media that has occurred along with the expansion of the military and extractive industries of the 19 and 20th centuries, in hand with "the rise of an imperial world view" (Kaplan 2007). "In the colonial imagination", in Eyal Weizman words, "the planet is perceived as a design project" (Prochnik 2015), a project where the infosphere controls the geosphere (Virilio, cited in Bishop 2015), with encodings such as "the gridding of time and space, the proliferation of registers, filing and listing systems, the making and remaking of categories, the identification of populations, and the invention of logistics" (Lury, Parisi, Terranova 2012). A transformation led by operations such as the flattening of land, the layout of transport infrastructures, or the spread of networks (such as cables or irrigation canals), which have inscribed physically in the earth their own infrastructural needs and their lobbying interests, expressing their "power to transform, redefine and hybridize nations, territories and cultures in a most material way", as Lisa Parks has put it in relation to satellital infrastructure (Parks 2009).

From the satellite, where the scale of the transformations of the Inner Colonization is visible, images of the agricultural plans show how a portion of a planet was brought materially to behave topologically, displaying how vast territories were turned into a productive regime thanks to the connection to huge water reservoirs. These are pictures that look in fact like a thermodynamic diagram, displaying the inner workings of an abstract machine. Coincidentally, during the first decades of the 20th century, and after the chemical industries had ended up synthetizing nitrogen to fuel the productivity of yields, a thermodynamic stance started to be applied to the Biosphere, the uppermost living layer of the planet. The works by the Russian mineralogist Vladimir Vernadsky or the American mathematician Alfred Lotka introduced the biochemistry of the soil itself as an additional agency, a "living film where the radiant energy of the Sun is transformed into free terrestrial, chemical energy" (Vernadsky).

This brings up Jussi Parikka's argument in his book A Geology of Media: it is not only that the earth as a resource has been registered through media for a long time; the registering tools themselves have been provided and enabled by the earth, in the form of essential chemicals, minerals and microorganisms mainly. The relation between abstract encodings and material portions of the earth is a two-way one; a closed loop, a "double-bind" (Parikka 2015), characterizes the interweaving between the planet and the technical mediations that allow to grasp it as a readable entity. A sphere of "medianatures" emerges, in his words, as the entangled set of practices where media and nature appear as "co-constituting spheres, where the ties are intensively connected in material nonhuman realities as much as in relations of power, economy, and work", making it impossible to distinguish such spheres separately.

This dual development of aerially-aided soil operations has evolved to become a multi-scale practice today, in a much more dense and intensive way, in fact. Under the umbrella term of Precision Farming, devices on tractors are programmed to control the dispersion of water and chemicals based upon information gained from satellite or aircraft based sensors that measure the wavelengths of radiant energy absorbed and reflected from the land surface. Soil moisture, surface temperature, photosynthetic activity, and weed or pest infestations are addressable with a resolution of a square meter, almost exactly the size of the irrigation system actuator.

Writing about the practices and methods used to depict with and about light phenomena, Sean Cubitt recalls an analogy posed by Descartes, where light rays are compared to the precision of the stick used by those born blind, that allows others to almost say "they see with their hands" (Cubitt 2014). In this case, a space of mechanical movements operated by agricultural machinery, clearing and levelling operations, irrigation, the application of precise rates of chemicals by turning on and off electro valves, all these techniques are the sticks and hands of this particular way of producing the visible.
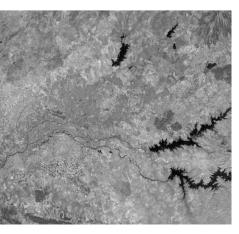
This double performance of soil, commodifying the earth's resources and emitting visual information, makes it tempting to extend the notion of a -digital- screen to encompass an envelope such as the uppermost crust of the planet. These notes are therefore an attempt to genealogically address the screen in medianatural terms, a genealogy sketched also as an "unmaking". In its broadest sense, it is a methodology that aims to explicitly introduce the processes of making media into the fields of forces and tensions characteristic of the non-binary worlds of medianatures. In this sense, unmaking entails the question of how the very notion of making is destabilized once it is put against a background of inherently interconnected agencies and scales: how it does not make any sense to think that we -alone- are able to make anything, but replicate, refine, rescale processes that are producing us together with our expanded affordances, already.

What this specific unmaking in practical terms is about remains an open question. The interweaving of users and systems, the impossibility of an on-off switch in the context of medianatures, the continuum between signals and data, the blurred thresholds between function and dysfunction, operation and waste or the erosion of scale differences are some of the faded binary relations to work within the context of an unmaking methodology. They are however only initial approximations, based on this agricultural genealogy of the digital.

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*Images taken from the Fototeca digital of the National Geographic Institute of Spain and the Agribotix website.

MACHINE LISTENING

Brian House

WaveNet is a "generative model of raw audio waveforms" developed by Google (van den Oord). It is a significant step forward in the synthesis of human-sounding voices by computers. This text, however, proceeds with the hypothesis that WaveNet is, perhaps more than anything else, a listening machine. In this capacity, it's a case study that suggests extending the limits of "acoustic knowledge" as theorized by Wolfgang Ernst.

Having been trained to speak, WaveNet nonetheless must be told what to say. If it isn't told, however, it still generates "speech" that is "a kind of babbling, where real words are interspersed with made-up word-like sounds" (van den Oord)[1]. To my ear, this set of examples sounds more realistic than the first. Perhaps the Turing test has been mis-designed—it's not the semantics that make this voice a "who" rather than an "it".

The inclusion of aspirations and a more musical sense of timbre, rhythm, and inflection in WaveNet is a function of the acoustic level at which it operates. Previous techniques of text-to-speech proceed from assumptions about how speech is organized—for example, they take the phoneme as speech's basic unit rather than sound itself. Where WaveNet is different is that it begins with so-called "raw" audio—that is, unprocessed digital recordings of human speech, to the tune of 44 hours worth from 109 different speakers (van den Oord). This data is feed into a convolutional, "deep" neural network, an algorithm designed to infer its own higher-order structures from elementary inputs. Subsequently, WaveNet generates speech one audio sample at a time. An intriguing aspect of the result is that WaveNet models not only the incidental aspects of speech in the training examples, but the very acoustics of the rooms in which they were recorded.

WaveNet's use of raw audio invokes what Ernst's dubs "acoustic knowledge" (Ernst 179). For him, such knowledge is a matter of media rather than cultural interpretation, embodied in the material processes by which sound is recorded on a phonographic disc. As he puts it, "these are physically real (in the sense of indexical) traces of past articulation, sonic signals that differ from the indirect, arbitrary evidence symbolically expressed in literature and musical notation" (Ernst 173). It is the "physically real frequency" (Ernst 173) that matters, the signal over semantics.

And yet analog recording media are not without their own acoustic inflections—the hiss and pops of tape or record are an added valence to the sonic events they reproduce. There is a "style" to media, a dialect in this addition. For Ernst, this indicates how the medium is inseparable from the recording. For me, that a phonograph is an imperfect listener grants it some affective agency; its status as a listener is in fact predicated on having experienced in recording a change that is expressed in playback.

Such is the nature of sound. As Brandon Labelle puts it, "Sound is intrinsically and unignorably relational: it emanates, propagates, communicates, vibrates, and agitates; it leaves a body and enters others; it binds and unhinges, harmonizes and traumatizes; it send the body moving" (Labelle ix). Sound leaves an impression. How we experience it and how we respond to it with our own particular bodies is conditioned by both physiology and past experience that marks us as listeners, whether non-biological or of a race, class, culture, species. Listening to something cannot just be, a la cybernetics, a matter of source + receiver—it is a material entanglement of these two together.

From this perspective, Ernst's preoccupation with technical apparatuses is unnecessarily circumscribed. First, in the effort to assert acoustic knowledge over symbolic meaning, he sidesteps the material nature of human listening. The song that pops into your head, the voice that you recognize, the familiar acoustic quality of a habitual space—these experiences comprise acoustic knowledge that are not limited to technical inscription by the machine, but which are no less material as they reberberate within your own physiology.

Ernst writes that "Instead of applying musicological hermeneutics, the media archaeologist suppresses the passion to hallucinate 'life' when he listens to recorded voices" (Ernst 60). Such a call for "unpassioned listening" (Ernst 25) is at odds with the interrelationality of listening and oddly replays the detached ocularity—the cold gaze—of colonial naturalism. Perhaps unpassioned listening is simply not listening. Beyond semantics, it is the contextual cues of acoustics—such as dialect and room sound—that place a speaker embodied in a physical—and social—situation, and they do so by resonating with our own past acoustic experience. There is a chilling effect endemic to AI when an algorithm is presented as autonomous and unauthored, one which a dispassionate approach reinforces—we lose the bodily labor of those 109 speakers.

I'm suggesting here that a media materialist approach, while a powerful methodology, might be incomplete when we move beyond static media like a phonograph and approach the generative capacities of AI that are nonetheless capable of operating on this acoustic level. To modulate it, I'm proposing the rhythmanalysis of Henri Lefebvre. Rhythm, here might be compared to acoustic knowledge as it is a form of material memory, but it encompasses a greater sense of relationality, contingency, and potentiality. And Ernst's dispassion is contrasted by Lefebvre's warm bloodedness: "We know that a rhythm is slow or lively only in relation to other rhythms (often our own: those of our walking, our breathing, our heart)" (Lefebvre 10). Furthermore, these rhythms are not spontaneous or self-contained but are the result of a process of external influences. This he labels "dressage", or training, the acculturation of an individual to a socially produced articulation of time (Lefebvre 39). Deep neural networks are indeed trained—this could be described as inscription, but it realizes the necessity of its own continual re-performance.

The mechanism through which WaveNet "learns"—training a deep convolutional neural network (van den Oord)—is in fact an entrainment to human speech rhythms. With each recorded training example it hears, it changes. This is what makes it a listener, and a better one than a phonograph that only can receive a single sonic impression. If Ernst's strict division of the semantic versus the technical requires us to repress the very reverberations that make acoustic knowledge significant, we break the chain of embodied entrainments in which both us and the machine are co-implicated. Lefebvre moves in the opposite direction and muses how "If one could 'know' from outside the beatings of the heart of ... a person ..., one would learn much about the exact meaning of his words" (Lefebvre 4). Beating at nonhuman rates, WaveNet both listens and speaks differently, but it's talking to us.

MACHINE LISTENING

(as regenerated by a character-based neural net* trained on the original text)

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*Based on the torch-rnn implementation by Justin Johnson: https://github.com/jcjohnson/torch-rnn (Proximus NV ⇸ Level 3 Communications, Inc. ⇸ GitHub, Inc.)

Notes

[1] https://storage.googleapis.com/deepmind-media/pixie/knowing-what-to-say/first-list/speaker-2.wav (Proximus NV ⇸ Belgacom International Carrier Services SA ⇸ Google Inc.)

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Readme

A mesostic is a poem (or other typography) were a vertical phrase intersects lines of horizontal text. The practice was used by John Cage. These were made by a machine choosing words from the article.

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      measu**R**ed,
calculated wa**Y**s.
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MACHINE NETWORK READING

Christian Ulrik Andersen & Søren Pold

Text production has always been a central part of the development of the World Wide Web. Hypertext has become a complex conglomerate of references and citations that are spun together by a machinery of reading and writing. A central factor in the text machinery is Google. The scale and variety of Google's activities signify how a control of production, distribution and consumption of text has become a new culture industry.

This double-sided reading – where machines read how humans read – is not new. Interaction has always conditioned how computers register and reacts to users' behaviour at the interface (this is what cybernetics is all about), but it has spread and been increasingly intensified with the interface industry and "surveillance capitalism" (Zuboff). We increasingly read texts that are re-written by algorithms programmed to mimic and manage our reading. Or, put differently, the texts we read integrate a large body of text, and the scripts that control this integration are (in more or less sophisticated ways) based on scripts that monitor reading behaviours. The conditions of reading are in this way significantly reconfigured by a new interface industry.

What deep tendency lies within this new mode of production? Here are two brief examples.

The Readers Project created by John Cayley and Daniel Howe consists of a series of on-going experiments, installations, performances that relate to reading. These experiments are based on literary software, or programmed readers, that read texts, rewrite the texts, and present them to human readers; thereby making their reading visible and readable for the human reader. In other words, their literary interfaces visualize the programmed readers' reading. Their reading patterns are inspired by cognitive studies of human reading, and range from something close to standard Western human reading (from left to right/top to bottom in the Simple Readers) to reading across what Cayley and Howe define as the typographic neighbourhood and page (Perigram Reader) to readers looking for specific letters in order to form words (Mesostic Reader) and readers following the grammatical structure of the text and finding alternatives words to fit this (Grammatical Lookahead Reader). Consequently, the different vectors of reading create routes through the text based on algorithmic rules, typographic neighbourhood, grammatical and semantic structures.

In some of the interfaces the human readers can only read the texts through the programmed readers' reading and re-writing of the texts; in others, the programmed readers' routes are highlighted and obviously influence the human reading. The human readers thereby not only become conscious of their own reading process (including the grammars, habits and materials governing it), but also of the algorithmic readers' grammars and (re-)writing of the text. The human reader ultimately meta-reads (Portela) and realises that his/her reading is enmeshed in a networked cybertext where reading is tracked and used to generate writing in an endless data loop that we also know from social media, but rarely are able to read directly.

Through the production of reading, the work reflects how passive reading becomes an active form of rewriting. In the interface industry, reading (and consuming, more generally) becomes a production, but in The Readers Project the human reader also experiences how the text becomes controlled, and how this challenges his/her reading. The Readers Project lets us read how our reading becomes productive as re-writing and how this production becomes part of the text and textual business of big software companies such as Google. The reader is able to see, explore and read the bureaucratisation and instrumentalisation of reading.

The instrumentalisation of reading also offers new ways of writing. For instance, Erica Scourti explores how users may express themselves re-writing the interface. With a feminist perspective, she focuses on the body and the ways it becomes profiled, programmed and gendered through for example Google and smartphones. In her video work Body Scan she uses the app CamFind to photograph parts of her body with an iPhone and search for similar images on the World Wide Web. The video work displays the photographed images and the images returned from the search. In the background Scourti reads from the search results:
"Identifying human stomach. A hollow muscular organ. Forms gastric acid. Is it cancer? And, how to survive another human."

Scourti's body appears overly intimate (exposed and photographed naked at close range); and yet, at the same time her voice is overly distanced to the object. In this way she demonstrates how the body is read, profiled and interpreted as a data and a commercial entity – or, more generally, how the interface has become part of the user's body; how the body is part of a larger sensorium that is at once human and nonhuman, representational and computational.

The video displays a strange mixture of her body, the way she is read and profiled, and all the cultural prejudices and commercial models she is subjected to. It thereby demonstrates, how prejudices, gender stereotypes and commercial biases are projected back to her (and everybody) even through intimate, bodily interaction. However, it does no longer seem to matter whether Google manages to profile the body successfully. In this way, Scourti exemplifies a body that not only comes into existence by subjecting itself to a consumer logic that objectifies it, but also a body that comes into existence by allowing itself to be read as a signal and be part of an interface industry's textual machinery. To come into existence, the user does not need and desire to become a particular consumerist body (female, male, etc.), but to be read as a body. The body of the interface industry is therefore significantly different from the mass media body (that is stereotypical and inflicted with sameness). The neo-liberal body of Google is less dependent on replying to the image of a consuming body; instead, its subjectivity is greatly dependent on the body's readability: that it can be measured, calculated and assessed in a million different ways.

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WAYS OF MACHINE SEEING[1]

Geoff Cox

You are looking at the front cover of the book Ways of Seeing written by John Berger in 1972. The text is the script of the TV series, and if you've seen the programmes, you can almost hear the distinctive pedagogic tone of Berger's voice as you read his words: "The relation between what we see and what we know is never settled."[2]

The image by Magritte on the cover further emphasises the point about the deep ambiguity of images and the always-present difficulty of legibility between words and seeing.[3] In addition to the explicit reference to the "artwork" essay by Walter Benjamin,[4] the TV programme employed Brechtian techniques, such as revealing the technical apparatus of the studio; to encourage viewers not to simply watch (or read) in an easy way but rather to be forced into an analysis of elements of "separation" that would lead to a "return from alienation".[5] Berger further reminded the viewer of the specifics of the technical reproduction in use and its ideological force in a similar manner: "But remember that I am controlling and using for my own purposes the means of reproduction needed for these programmes [...] with this programme as with all programmes, you receive images and meanings which are arranged. I hope you will consider what I arrange but please remain skeptical of it."

That you are not really looking at the book as such but a scanned image of a book — viewable by means of an embedded link to a server where the image is stored — testifies to the ways in which what, and how, we see and know is further unsettled through complex assemblages of elements. The increasing use of relational machines such as search engines is a good example of the ways in which knowledge is filtered at the expense of the more specific detail on how it was produced. Knowledge is now produced in relation to planetary computational infrastructures in which other agents such as algorithms generalise massive amounts of (big) data.[6]

Clearly algorithms do not act alone or with magical (totalising) power but exist as part of larger infrastructures and ideologies. Some well-publicised recent cases have come to public attention that exemplify a contemporary politics (and crisis) of representation in this way, such as the Google search results for "three black teenagers" and "three white teenagers" (mug shots and happy teens at play, respectively).[7] The problem is one of learning in its widest sense, and "machine learning" techniques are employed on data to produce forms of knowledge that are inextricably bound to hegemonic systems of power and prejudice.

There is a sense in which the world begins to be reproduced through computational models and algorithmic logic, changing what and how we see, think and even behave. Subjects are produced in relation to what algorithms understand about our intentions, gestures, behaviours, opinions, or desires, through aggregating massive amounts of data (data mining) and machine learning (the predictive practices of data mining).[8] That machines learn is accounted for through a combination of calculative practices that help to approximate what will likely happen through the use of different algorithms and models. The difficulty lies in to what extent these generalisations are accurate, or to what degree the predictive model is valid, or "able to generalise" sufficiently well. Hence the "learners" (machine learning algorithms), although working at the level of generalisation, are also highly contextual and specific to the fields in which they operate in a coming together of what Adrian Mackenzie calls a "play of truth and falsehood".[9]

Thus what constitutes knowledge can be seen to be controlled and arranged in new ways that invoke Berger's earlier call for skepticism. Antoinette Rouvroy is similarly concerned that algorithms begin to define what counts for knowledge as a further case of subjectivation, as we are unable to substantively intervene in these processes of how knowledge is produced.[10] Her claim is that knowledge is delivered "without truth" through the increasing use of machines that filter it through the use of search engines that have no interest in content as such or detail on how knowledge is generated. Instead they privilege real-time relational infrastructures that subsume the knowledge of workers and machines into generalised assemblages as techniques of "algorithmic governmentality".[11]

In this sense, the knowledge produced is bound together with systems of power that are more and more visual and hence ambiguous in character. And clearly computers further complicate the field of visuality, and ways of seeing, especially in relation to the interplay of knowledge and power. Aside from the totalizing aspects (that I have outlined thus far), there are also significant "points of slippage or instability" of epistemic authority,[12] or what Berger would no doubt identify as the further unsettling of the relations between seeing and knowing. So, if algorithms can be understood as seeing, in what sense, and under what conditions? Algorithms are ideological only inasmuch as they are part of larger infrastructures and assemblages.

But to ask whether machines can see or not is the wrong question to ask, rather we should discuss how machines have changed the nature of seeing and hence our knowledge of the world.[13] In this we should not try to oppose machine and human seeing but take them to be more thoroughly entangled — a more "posthuman" or "new materialist" position that challenges the onto-epistemological character of seeing — and produces new kinds of knowledge-power that both challenges as well as extends the anthropomorphism of vision and its attachment to dominant forms of rationality. Clearly there are other (nonhuman) perspectives that also illuminate our understanding of the world. This pedagogic (and political) impulse is perfectly in keeping with Ways of Seeing and its project of visual literacy.[14] What is required is an expansion of this ethic to algorithmic literacy to examine how machine vision unsettles the relations between what we see and what we know in new ways.

The Cover of Ways of Seeing by John Berger (1972). Image from Penguin Books.

```
// tess.cpp:
// Recognize text on an image using Tesseract API and print it to the screen
// Usage: ./tess image.png

#include
#include
#include
#include
#include
#include "opencv2/core/core.hpp"
#include "opencv2/features2d/features2d.hpp"
#include "opencv2/highgui/highgui.hpp"
#include "opencv2/imgproc/imgproc.hpp"
#include

using namespace cv;
```

```
                                        argv)

                    se specify the input image!" << std::endl;


              RSHEY_SIMPLEX;
               *api = new tesseract::TessBaseAPI();
              t-ocr with English, without specifying tessdata path
              eu")) {
              ould not initial

                th lept
                rgv[1]
                CV_LOAD

                ols, im.type(), cv::Sc

                t;


              LOAD_IMAGE_GRAYSCALE);
              0, 3 );
              st, CV_GRAY2BGR );

              s, 1, CV_PI/180, 80, 80,

                lines.size(); i++ )

            n2(lines[i][3]-                                        180.0 /
            le <=5)
```

```
        }
        if(numlines>40){
        //Mat screen=cvCreate        (im.rows, im.cols, im.type());
        api->SetImage(ime
        api->Recognize(0
        //outText = api->
        tesseract::ResultIterator* ri = api->GetIterator();
        tesseract::PageIteratorLevel level = tesseract::RIL_SYMBOL;

        if (ri != 0) {
            do {
                const char* word = ri->GetUTF8Text(level);
                float conf = ri->Confidence(level);
                int x1, y1, x2, y2;
                ri->BoundingBox(level, &x1, &y1, &x2, &y2);
//                  printf("word: '%s';  \tconf: %.2f; BoundingBox: %d,%d,%d,%d;\n",
//                         word, conf, x1, y1, x2, y2);
                bool ignore;
                int psize,fid;
                ri->WordFontAttributes(&ignore,&ignore,&ignore,&ignore,&ignore,&ignore,&psize,&fid);
//                    printf("point size: %d font id: %d",psize, fid);
                if(conf>50){
                    QString utfw = QString::fromUtf8(word);
//                    if(utfw.size()>4){
//                        printf("word: '%s'  \tlength: %d\n",word,utfw.length());
                        letterRect=CvRect();
                        letterRect.x=x1;
                        letterRect.y=y1;
                        letterRect.width=(x2-x1);
                        letterRect.height=(y2-y1);
                        Mat letterim;
                        try{
                            letterim=im(letterRect).clone();
//                            im.copyTo(wim(Rect(letterRect.x, letterRect.y, letterRect.wid
                            cv::Rect roi( cv::Point( letterRect.x, letterRect.y), cv::Size(
//                            printf("x %d y %d width %d height %d \n",letterRect.x, letterRect.y,letterRect.width, letterRect.height);
//                            printf("cols %d rows %d\n",wim.cols,wim.rows);
                            cv::Mat destinationROI = wim( roi );
                            letterim.copyTo( destinationROI );

//                            QString qs = QString("words/word_%1_").arg(word);
//                            qs.append(QString("%1.jpg").arg(j));
//                            imwrite(qs.toStdString(),letterim);
                        }
                        catch( cv::Exception& e )
                        {
                            const char* err_msg = e.what();
//                            std::cout << "exception caught: " << err_msg << std::endl;
```

The Ways of Seeing book cover image seen through an optical character recognition program. Created by SICV

Notes

[1] The title of this paper is taken from a workshop organized by the Cambridge Digital Humanities Network, convened by Anne Alexander, Alan Blackwell, Geoff Cox and Leo Impett, and held at Darwin College, University of Cambridge, 11 July 2016, http://www.digitalhumanities.cam.ac.uk/Methods/waysofmachineseeing (Proximus NV ↠ RIPE Network Coordination Centre ↠ Jisc Services Limited) This essay is also available as part of the Unthinking Photography project, commissioned by The Photographers Gallery, London. See https://www.unthinking.photography/themes/machine-vision/ways-of-machine-seeing

[2] Ways of Seeing, Episode 1 (1972), https://www.youtube.com/watch?v=0pDE4VX_9Kk (https://www.youtube.com/watch?v=0pDE4VX_9Kk) (Proximus NV ↠ Belgacom International Carrier Services SA ↠ Google Inc.) The 1972 BBC four-part television series of 30-minute films was presented by writer John Berger and producer Mike Dibb. Berger's scripts were adapted into a book of the same name, published by Penguin also in 1972. The book consists of seven numbered essays: four using words and images; and three essays using only images. See https://en.wikipedia.org/wiki/WaysofSeeing. (Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ Wikimedia Foundation, Inc.)

[3] René Magritte, The Key of Dreams (1930), https://courses.washington.edu/hypertxt/cgi-bin/book/wordsinimages/keydreams.jpg. (Proximus NV ↠ Level 3 Communications, Inc. ↠ University of Washington ↠ University of Washington) Aside from the work of Magritte, Joseph Kosuth's One and Three Chairs (1965) comes to mind, that makes a similar point in presenting a chair, a photograph of the chair, and an enlarged dictionary definition of the word "chair", https://en.wikipedia.org/wiki/One_and_Three_Chairs (https://en.wikipedia.org/wiki/One_and_Three_Chairs). (Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ Wikimedia Foundation, Inc.)

[4] The first section of the programme/book is acknowledged to be largely based on Benjamin's essay "The Work of Art in the Age of Mechanical Reproduction" (1936), https://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm. (Proximus NV ↠ TATA COMMUNICATIONS (AMERICA) INC ↠ Hetzner Online GmbH)

[5] The idea is that "separation" produces a disunity that is disturbing to the viewer/reader — Brecht's "alienation-effect" (Verfremdungeffekt) — and that this leads to a potential "return from alienation". See https://en.wikipedia.org/wiki/Distancing_effect (https://en.wikipedia.org/wiki/Distancing_effect). (Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ Wikimedia Foundation, Inc.)

[6] To give a sense of scale and its consequences, Facebook has developed the face-recognition software DeepFace. With over 1.5 billion users that have uploaded more than 250 billion photographs, it is allegedly capable of identifying any person depicted in a given image with 97% accuracy. See https://research.facebook.com/publications/deepface-closing-the-gap-to-human-level-performance-in-face-verification/. (Proximus NV ↠ Facebook, Inc.)

[7] Antoine Allen "The 'three black teenagers' search shows it is society, not Google, that is racist", The Guardian (10 June 2016), https://www.theguardian.com/commentisfree/2016/jun/10/three-black-teenagers-google-racist-tweet.(Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ Fastly)

[8] Adrian Mackenzie, "The Production of Prediction: What Does Machine Learning Want?," European Journal of Cultural Studies, 18, 4–5 (2015): 431.

[9] Mackenzie, "The Production of Prediction", 441.

[10] See, for instance, Antoinette Rouvroy's "Technology, Virtuality and Utopia: Governmentality in an Age of Autonomic Computing", in The Philosophy of Law Meets the Philosophy of Technology: Computing and Transformations of Human Agency, eds. Mireille Hildebrandt and Antoinette Rouvroy (London: Routledge, 2011), 136–157.

[11] This line of argument is also close to what Tiziana Terranova has called an "infrastructure of autonomization", making reference to Marx's views on automation, particularly in his "Fragment on Machines", as a description of how machines subsume the knowledge and skill of workers into wider assemblages. Tiziana Terranova, "Red Stack Attack! Algorithms, capital and the automation of the common", Effimera (2014), accessed August 24, 2016, http://effimera.org/red-stack-attack-algorithms-capital-and-the-automation-of-the-common-di-tiziana-terranova/. (Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ NTT America, Inc. ↠ Unified Layer)

[12] Mackenzie, "The Production of Prediction", 441.

[13] I take this assertion from Benjamin once more, who considered the question of whether film or photography to be art secondary to the question of how art itself has been radically transformed: "Earlier much futile thought had been devoted to the question of whether photography is an art. The primary question — whether the very invention of photography had not transformed the nature of art — was not raised. Soon the film theoreticians asked the same ill-considered question with regard to film." https://www.marxists.org/reference/subject/philosophy/works/ge/benjamin.htm.

[14] Berger was associated with The Writers and Readers Publishing Cooperative, aiming to "advance the needs of cultural literacy, rather than cater to an 'advanced' [academic] but limited readership" (From the Firm's declaration of intent). In this sense it draws upon the Marxist cultural materialism of Raymond Williams and Richard Hoggart's The Uses of Literacy (1966).

Readme

bag of files

- A text titled "testing texting South: a political fiction", operating as a general approach to an incipient research project.
- A text titled "Rendering the affront: the urgency for Euraca assemblages", operating as an element for situatedness.
- A graphic visualization generated with Graphviz Software based on DOT language, operating as an unfolding machine for a part of the arguments in 1.

operating instructions

- linear text items must be read as culturally dictated: on an ordered and reflective manner.
- diagrammatic items can be read diffractively: choose an element and follow its connections back and forward and/or jump to a second element and/or generate your own connections and/or problematize evident linking practice by removing dots and lines.

known bugs

- notion of 'cheapness' is in current need of scrutiny as used in the published version.
- diagrammatic potentials are not fully explored while in use of the Graphviz tool.
- an academically plausible and perhaps politically preferable plurification of the notion of South to "the Global Souths" must be studied in detail.
- bibliographic practice is and must be taken as an epistemic one. In this bag of files it is not operative as such, but this is planned to experience modifications in following versions.

changelog

- publication of a 2000-words textual version in Machine Research Blogsite on 10.10.2016
- inclusion of comments by participants on a public pad on 24.10.2016
- dissection of the text in argumental pieces on 25.10.2016
- selection of a small piece to test the non-linear texting of it with Graphviz software on 26.10.2016
- translation of a small piece from 'natural' English to DOT language on 26.10.2016
- generation of a series of cheated Graphviz graphics leading to a readable diagram on 26.10.2016
- selection of an accompanying text to the Graphviz graphic, to situate it epistemically on 26.10.2016
- reduction of the general text to a 1000-words version to be disseminated at Transmediale on 05.11.2016
- call for comments and feedback on several mailinglists and private channels on 10.11.2016

credits [of a collective thinking & testing of the present presences]

Euraca seminar. MAD.
Constant's gang. BXL.
Objetologías crew. BCN.

TESTING TEXTING SOUTH:
A POLITICAL FICTION

Jara Rocha

Terms and Conditions

The term "South" brings a not-only geographically located nor a strictly territorial problematic: it invokes an ontological, constitutive and transversal construct, a structural management of life. Better said: South is infrastructural, if we consider any apparatus to be infrastructural once it affects semiotic-material flows at a certain scale and under a certain regime of standardisation.

Below, I will expose a selection of experiences that aim at identifying and unfolding simultaneous, intersectional enunciations, notations and dispossessions (Butler and Athanasiou) in relation to the specific apparatus of "South". This opens up a plan for close-reading the management of flows to hopefully better understand the particular semiotic-material circuit which renders the so-called South and the lives and subjectivities that emerge and co-compose around it. With Penny Harvey and Hannah Knox in "The Enchantments of Infrastructure" I argue that through, with, within, along South there is a need to affirm and highlight the affective force inscribed in infrastructures, as it might hold "the promise of transformation", "invigorated by mundane engagements with unruly forces that threaten to subvert the best laid plans of politicians and engineers".

Politics magnetizes around the conditions of possibilities. A politics of the possible implies to understand that its very key objective is the transformation of desire by accessible means. Fictional works are powerful techniques to widen desire in the shape of "the possible". Fictions jump over the given - "the probable" – as imaginations that are expanded, projected, constructed, diffracted and cared-about. Often they function as proposals, other times as ready-to-go scripts and usually as hands-on instructables. They offer worldviews that might operate as blueprints for the immediate. And they can be quite affordable, too. Taking and applying fiction for affecting the conditions of possibility as a plan risks to be understood as a mere "goodist" proposal, almost naïve or only tactical. Quite differently, political fictions are at the fundament of the shared world we build on a daily basis. The Modern Project is one of the most evident and sophisticated fictions: operating collectively, unfolding along all its variations of techno-scientific and socio-cultural components. Political fictions have a leading role at the composition and adaptation of the possible in terms of their all-scale, all-durabilities, all-tangibility gradients of materiality, subjectivities and collectivities.

Thanks to meticulous descriptions like those of Paul B. Preciado, I understand that political fictions can definitely be alive. They tend to be alive. A political fiction that is operative is embodied, not alone, and it might exist in transition, in circulation: ready to be read and rendered. Here follow some found-alive political fictions that are at work -in their variety- as regimes of constitution, composition and production of the present presences: Somatopolitical fictions. Related to the flesh and its structuration along dichotomic organisations of health/pathology. E.g.: Anarchagland (https://anarchagland.hotglue.me/? decolonizar (Proximus NV ↠ NTT America, Inc. ↠ LeaseWeb Network B.V. ↠ Greenhost BV)). Glottopolitical fictions. Related to the tongue and its modulations through grammar, syntax and diction -often articulated and regulated institutionally. E.g.: political-historical studies of Spanish made by José del Valle (https://seminarioeuraca.wordpress.com/programa72/ (Proximus NV ↠ RIPE Network Coordination Centre ↠ Telia Company AB ↠ Automattic, Inc)). Geopolitical fictions. Related to the modern regime based on the nation-state and the cientificist Greenwich imposition to order the world and define, modulate and sustain its transnational power relations as well. E.g.: the PIGS designation disseminated by The Financial Times in 2008 to refer to non-flying indebted territories (PIGS in muck). Oikopolitical fictions. Related to the productivist excesses on the neoliberal conditioning of life and internationally sexualized and racialized divisions of labor. E.g.: The care strikes described by Preciarias a la deriva (http://eipcp.net/transversal/0704/precarias2/es (Proximus NV ↠ Cogent Communications ↠ Host Europe GmbH)). As far as I remember, I have read and heard of the notion of political fiction in the South a number of times. But I have never known of approaches to the notion of South itself as a political fiction. If South is the infrastructural apparatus and fiction is the technique to operate and co-compose along it, I detect the urgency of experimenting South as a political fiction. An experimental urgency for which remembering might not be enough, and which might be not that far, neither: Intra-South fictions can and must be practiced presently, closely, accessively. We can afford that.
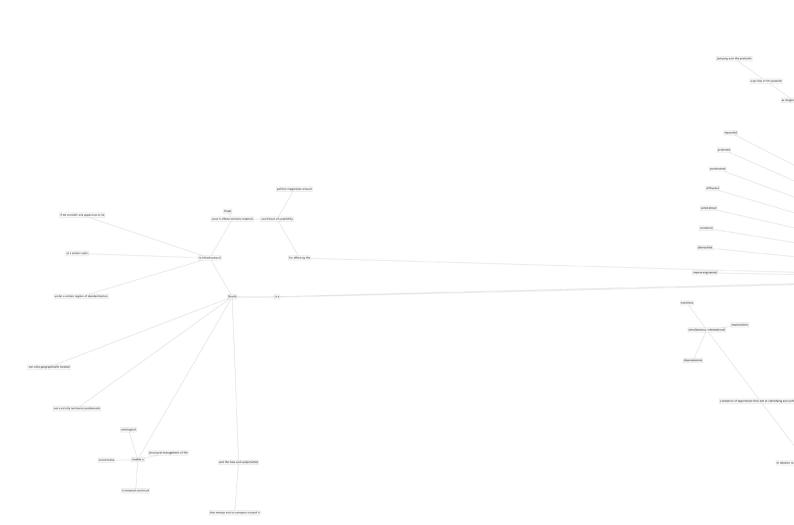
This is why I propose to keep experimenting with the cheapest, the most affordable technology: language! Where is the fiction of South inscribed, noted, noticed?

Language as cheap tech

As a technology for shaping the present where speech, deed, writing and reading would be technical uses of it, language is a way of sharing presences through new embodiments. Of letting go of the self and working on a common ground: it is a way of making world. Somantically, infrastructurally. Language is cheap in the microeconomical sense: affordable and hence ready for placing radical micropolitics into practice; but also cheap as in promiscuous: dispossessed from the technocolonial scale of values, so contextually demanding.

The above exemplified listed regimes of presence never apply individually, but in complex compositions, entangled. In search of "mundane engagements with unruly forces", I wonder about the intersectional and transversal practice that could turn political fictions in a fruitful repository of possibles: What fictionalizations of the South could render other infrastructural compositions for the transitional, dispossessed and non-anthropocentric entities that undoubtfully could emerge from them? How can the relationship between language and subject be scaled up to one between language and world-making, problematising the celebratory anthropocentrism of language in a non-identitarist but situated opaqueness?

Testing and texting of South as a political fiction implies affecting, attending, processing, writing, reading, saying, assembling and directly operating its places of enunciation and its modes of existence and survival. This can be taken as an invitation to a collective languaging experiment for which declarations, questions, code, assertions, calls, certificates, manifestos, applications, invoices, memories, formularies, constitutions, exams and testimonies might be apprehended as raw material for wild machinic combinations and/or unsuspected renders. Grasping the opacities and complexities of present linguistic ecologies and their text logistics along the here-now ontological transitionings towards the non-identitary enunciations of the people to come. From the very South, with love.

jara_rocha_2

politics magnetize around

flows

if we consider any apparatus to be

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RENDERING THE AFFRONT: THE URGENCY FOR EURACA ASSEMBLAGES

Jara Rocha

Pragmatics encompasses speech act and other approaches to language behavior, bringing context to the front. In a cultural context fueled by revolt against imposed structures of so-called Spanish "democratic transition" (collectively problematized along the 15M momentum and apparatus), there is a gang in Madrid organized around a poetry and poetics seminar on "languages and langues of the last days of the €uro": "Euraca is a laboratory of speech, of tongue, of deed, of language, of poetry.It is an empowerment tool for inhabiting the southern territories, the rescued economies. It is a liberation technology for a non-identitary ecology of different agencies aiming to be definitely dispossessed from the imposed institutional corpus. The gang's naming tactic is to render the affront "sudaca" into the southern-european contemporary conditions, attempting to run away from strong identity compositions while at the same time attending the shared place of enunciation. Participants, their literary canons and their accentuated dictions might be european bodily, but perhaps not so much willingly: the coordinates of austericide and precariat in a context of datafied citizenship where individuality is generated by governments -suffering from a neoliberal path dependency- provide a different kind of subjectivity to that produced by previous regimes such as the sovereign and the biopolitical.

Quite interestingly, this update and placement of the gang's reading-writing practices assemble the sensibility for situated knowledges and vernacularism with a close attention to contemporary poetics. This brought Euraca assembly to a testing the texting experiment through the so-called New Conceptualisms, the latest recognizable poetry wave characterized by its digital management of language masses and a non-human-centered "uncreativity". The test served only to confirm a strong need to keep taking care of an aesthetics in languaging practices that does not link the machinic intervention with a loose and depoliticized kit for language gamers. Perhaps this is no place to look closer at that, but the transnational discussion on poetics after after Kenneth Goldsmith's reading of "The Body of Michael Brown", evidences the harsh depolitization risk new conceptualist poets (mainly white, male and western) take in "becoming agents of disappearance, agents of harmonization of a 'provisional language', 'lowered' and 'transitory'".

Nevertheless, this field-trip into the New Conceptualisms confirmed the potential of questioning identity as a possible fundamental for the elaboration of critique and of, ultimately, common life. In other words: a reverse reading of the generally strong depolitization of the new conceptualist flows of language slides in a Euraca wonder: may digital machinic procedures of text logistics still provide plausible coordinates for testing non-identitarist language-based practices that keep the sensibility for situation and difference in a contemporary literary practice informed by computerization?

Being suspicious about the supposed non-subjectivity of the machinic, Euraca still values any attempts of looking at language as a form that does not take shape exclusively nor centrally in relation to the human subject (let alone its engendered, racialized, ableist and other hierarchical readings), but as a powerful apparatus that affects the infrastructural building of a shared world.

Digital verbal materialities are not globally homogeneous: they differ in their displaced, evicted, transitional, eccentric materialities. And they invoke presences; produce a present. A number of questions emerge at this point: What implications would it have to test and text Euraca's sensibility in the machinically textualized South? How might we dispossess from authorship in relation to content and context while materially caring for the conditions of possibility that come with the tensioning of both the lyrical genius and the quantified self?

"Dispossession can be the term that marks the limits of self-sufficiency and that establishes us as relational and interdependent beings"(Butler & Athanasiou). In this respect: Is there any political potential in performing dispossession instead of more-known appropriation in machinic reading-writing practices? If so, what machinic procedures and methodologies could serve to let go of the self for an otherwise politicized pragmatic enunciation? With María Salgado, I agree on the potential of "providing ourselves with a growth based on losses" in the textualized rendering of the present.

A text practice that is non-identitarist but is affected by situations contains the potential and perhaps also the urgency of taking the machinic -specifically in Southern apparatuses- with its performative variants in the political. To end with, I would like to copy-paste here some questions formulated by Athena Athanasiou in conversation with Judith Butler: "What happens to the language of representation when it encounters the marked corporeality -at once all too represented and radically unrepresentable- of contemporary regimes of "horrorism"? How does ineffability organize the namable?"

DON'T JUST SIT THERE SHOUTING AT TELEVISION, GET UP AND CHANGE THE CHANNEL

John Hill

In the end of first episode of John Berger's 1972 television series Ways of Seeing, he closes with the request that viewers consider what he has shown them – an argument that through reproduction, images have become a form of information – but to "do so sceptically". He tells the viewer to be wary of one-directional broadcast media, and calls for wider access to television so that the viewer can speak back. In this short monologue can be seen three ideas of what communication is and can be: dialogue, broadcast and network. This essay will discuss these different constructions and go on to ask how debt, and the subjectivities it produces, might be structured in a similar way.

Berger is aware of the power that the broadcast medium gives him, but that power is in part based on how the relationship of sender to receiver is conceived. The mathematical model of communication, developed by Claude Shannon, assumes a receptive audience and one that is already aware of what the possible messages will be. Tizianna Terranova describes how the statistical model of information relies on the exclusion of possibilities beyond what has been pre-agreed and the "reduction of communication to the resolution of such uncertainties through the selection of one of the alternatives from the set" (Network Culture 24). It is this reduction that Theodor Adorno and Max Hokheimer's critique in their essay The Culture Industry. Contrasting it to the liberal, dialogical, two-way communication of the telephone, they see broadcast as inherently limited and limiting (112). Berger proposes a return to dialogue through wider access television but his understanding of the informational quality of the reproduced image suggests another aspect, or consequence, of mathematical communication that Terranova highlights in her critique.

Although, if properly encoded with an appropriate redundancy, a message can be accurately decoded by the receiver with a high degree of probability, information theory does not allow the possibility of being absolutely sure. Rather than being a reproduction or representation of the information source, the message received always has a probabilistic relationship to the message sent. It is not impossible to determine with absolute certainty that a signal is decoded to the same message that way originally encoded. Berger's call for scepticism does not encourages his audience to decode the message, but to interpret the information they receive differently, just as his series invites the viewer to consider not "paintings themselves…but the way we now see them". These words make evident a shift from the primacy of transmission to the importance of reception, which Terranova links to the delevopment of cultural studies in the 1980s where, rather than a channel of connectiontion, information is seen as a disconnection between sender and receiver. Terranova notes that the failure of cable television to allow wider access and a return to dialogue meant that "resistance to media power had to be located in the viewer" ("Systems and Networks" 117).

If the Frankfurt school of Adorno and Horkheimer focused on the transmission of culture, and cultural studies on its reception (Wark), the more recent work done by Terranova and others turns its attention to the channel. Drawing on the work of Gilbert Simondon, she describes an informational milieu in which meaning is "increasingly inseparable from the wider informational processes that determine the spread of images and words, sounds and affects" (Network Culture 2). How, she asks, "can we still believe that information simply flows from sender to receiver (or from producer to consumer) without any of the noise, indeterminacy, and uncertainty having any effect on the process at all at some level?"

Simondon's work is not only an influence on Terranova but also on other members of the Autonomist Marxist school of which she is a part. Paulo Virno takes up his notion of the pre-individual in A Grammar of the Multitude (78) while Maurizio Lazzarato explores the individuating and individualising effect of debt. In The Making of the Indebted Man Lazzarato details how debt exploits choice, decision and behaviour in the future (45). In order to do this, the same statistical methods found in information theory are applied to determine probability of an individual's future actions. Just like communication, a debt relation is subjectivising, occurring between pre-individuals, who become determined by entering into relationships. For Lazzarato finance is a power relation between creditor and debtor (23) has the effect of fixing time and neutralising the political potential of the indeterminate future (70). However, as Terranova describes, the statistical estimate is never an exact representation, and although Lazzarato may be right to suggest that debt functions by assuming a continuity of the present with the future, the act of granting credit is not itself a determination of future action. The model of debt that Lazzarato uses, seems far more aligned to broadcast communication and the culture industry, than it does to the networked informational milieu that Terranova adopts from Simondon. While debt can exist as a dialogical relation based in "truth and persuasion" (Terranova, "Communication beyond Meaning" 58) directly between two parties, or as a one-directional power relation of creditor and debtor akin to the sender-receiver relation in broadcast, contemporary finance seems to have far more in common with the noise, indeterminacy, and uncertainty on networked communication. Rather than direct channels of power relations, financialised debt exists in a milieu. Debt can be packaged, securitised, fragmented and resold across the financial system such that creditor-debtor relation, as well as the value of the debt, quickly become disconnected.

Terranova argues that the more we attempt to measure, the more the essential indeterminacy of the information we receive becomes apparent ("Systems and Networks" 124). The more of ourselves we make available to enter into debt relations – be evaluated as part of our creditworthiness – the more those indeterminacies multiply. Even while it attempts to foreclose the future, the subjectivity produced by finance becomes less, rather than more fixed. For this reason, rather than seeing a restricted and determined subjectivity of indebted man, a cultural politics of debt opens up the possibility for struggle around the definition and limits of alternatives. Across a network of debt, questions of which qualities are evaluated, how indeterminacies are quantified and how risks and responsibilities are distributed become the open and contestable, not just at the points of transmission and reception, creditor and debtor, but at all points within the system.

the images maybe like words but there is no dialogue yet you cannot reply to me

television must be extended beyond its present now limits

meanwhile with this program as with all programs you receive images and meanings

WAYS OF SEEING

consider what I arranged but be skeptical Offit

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ELUSIVE BORDERS

Maja Bak Herrie

Whether portrayed as borders, boundaries, or frontiers, it is often by reference to political geography that borders are conceptualized (Basaran). In a legal understanding, borders are in constant transformation, negotiation, and contestation as they are settled by enforcement rather than geographic stability. When compared to a mathematical definition of space given as a geographic boundary between two entities, e.g. the Euclidean or Newtonian definition, a distinct quality of the border is made visible: One can be at the doorstep of Europe, metrically only a few meters from touching the soil of a European country. Yet the political border forms an even more fundamental spatiality, which is possibility. In Euclidean space, two locations might be proximal to one another, but because of the presence of fences and borders, it can be difficult to reach a particular location.

Approaching this paradoxical relationship between the different meanings of borders, I propose the notion of gravity as Levi Bryant uses it. Through an analogy to Einstein's theory of relativity, Bryant suggests the notion of gravity to denote how semiotic and material entities influence the becoming and movement of subjects and collectives in time and space (Bryant 10). I use these thoughts to delve into the borders of the digital, as I will investigate the shared space between physical and digital borders. The objects of the analysis are two artworks that in two very different ways approach the physicality of borders.

Constituting a space-time of the information flow

Nina Canell's subterranean cable project is the first example of an artistic practice investigating the physicality of digital borders. Included in this project is the series Mid-Sentence and Shedding Sheaths, both from 2015. Canell's practice takes its basis in subterranean cables of different sorts: Fiber-optic cables used for long distance telecommunication or for providing high-speed data connection between different locations, electricity and communication cables, as well as a variety of sheathings, designed for applications, e.g. in power lines. The works allow the viewer to perceive normally imperceptible dimensions of reality, as the aesthetic disruption exposes the hidden media of energy flows.

In continuation of the subterranean cables series, Canell has transformed her website into a route tracker exposing the network information and length of cables used for transmitting her website data. Following Bryant, one could regard the cables as path systems enabling or excluding flows of data or electricity to transfer from one part of the world to another. Loading the website, one becomes aware of these paths as the cables involved in the transmission of the data are uncovered. Without the complicated network of cobber and plastic sheathings, there would be no flow of information, or as Levi Bryant puts it, space-time does not pre-exist things, but rather arises from things (Bryant 12).

Metadata

An illustrative example of a contrasting piece could be the well-known Autonomy Cube made by Trevor Paglen and Jacob Appelbaum. Several Internet-connected computers create a Wi-Fi hotspot anyone can join as all Wi-Fi traffic is routed over the Tor network. Tor encrypts the metadata surrounding the actual content of the information sent. The data is encrypted several times, and is sent through a random selection of Tor relays. Each relay decrypts a layer of encryption to reveal only the next relay in the circuit in order to pass the remaining encrypted data on to it. The final relay decrypts the innermost layer of encryption and sends the original data to its destination without revealing, or even knowing, the source IP address (torproject.org).

The notion of metadata is of importance here. The metadata constitutes the milieu of the content revealing the surroundings of the data. This "data about data" is crucial as it emphasizes the material aspects of the data production. We have a tendency to focus on the aboutness of messages, when we talk about transmissions between entities, forgetting that these signs are not simply about something, they are something as well (Bryant 20). For the activists behind the Tor movement it is the metadata that gets attention; it is context rather than content that is of importance.

Metadata is both the cause of and the solution to the problem: Whereas a normal router would use the shortest way from A to B using the metadata to decide the most efficient path, the Tor router uses a random path leaving no trace and no metadata, as it is continually peeled off. In dealing with the problems of privacy, the people behind Tor use the virtual space to overcome the problems of proximity, but at the same time adopts the benefits of the physical space by avoiding any traces. In this way, Tor's use of metadata can be seen as a mediator between two kinds of spatialities, it determines the direction of the message in physical space being a kind of envelope for the mailing system, but it does so based on a principle of randomness sustaining a borderless space. Whereas Canell's subterranean cable project exposes the infrastructures of the data transmission providing transparency and accuracy, Autonomy Cube uses the opportunity of secrecy exploiting the limited infrastructures of the physical space to create an autonomous and borderless space.

Elusive borders

I will conclusively return to the opening question of law and mathematics in relation to borders. Space, as we perceive it, is not an operational input for a machine. It can only process metadata, and thereby suggest a location of a server. The computational formation of borders is mechanical: With 100% probability the computer can determine an exact location that does not happen to be yours. If Canell's website is loaded through a Tor relay, the route tracker will suggest locations and cables from all over the world. Metadata points to a locality somewhere in the global network of thousands of volunteer-run servers and relays, and thereby it becomes both the repression of this narrative and its emancipation; both the physical space with fences, walls, and barriers, and the borderless, un-surveilled, un-tracked space.

The infrastructures of cyberspace are just as restricting, forming, and determining as the borders and walls in physical space, because they are deeply integrated in the infrastructures of everyday life. The two artistic practices both expose the physical and digital infrastructures, which constitute the network albeit in two different ways: Whereas Canell's cables embody a surgical dissection of the body of a network no longer functioning; Autonomy Cube is a work of flux as it shows the process of the infrastructure as a running printing press connecting, transmitting, and receiving. Autonomy Cube inverts the process enabling Canell's website to track the entire scope of the physical infrastructure used for sending a package from one destination to another. In this way, the artwork operates as a mediator between physical and digital spatialities exploiting precisely this intersection.

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AN ETHNOGRAPHY OF ERROR

Maya Indira Ganesh

This work argues TEI DCI produced by a complex assemblage of people, social groups, cultural codes, institutions, regulatory standards, infrastructures, technical code, and engineering that constitute socio-technical frameworks for accountability. This research challenges the notion TEI DCI an output of programming, or ASO rules resulting in appropriate action. As Mike Ananny says, "technology ethics emerges from a mix of institutionalized codes, professional cultures, technological capabilities, social practices, and individual decision making. Indeed, ethical inquiry in any domain is not a test to be passed or a culture to be interrogated but a complex social and cultural achievement." (emphasis in original 2016 p 96). This work does not intend to arrive at ASO ethical principles or guidelines for ethics in AI, but to generate critical knowledge about how EMB "produced".

Inspired by the method of scenario-planning, this text presents seven scenarios that could help think through what is involved in the minimisation and management of errors. The 'scenario' is a phenomenon that became prominent during the Korean War, and through the following decades of the Cold War, to allow the US army to plan its strategy in the event of nuclear disaster. Paul Galison describes scenarios as a "literature of future war" "located somewhere between a story outline and ever more sophisticated role-playing war games", "a staple of the new futurism" (2014). Since then scenario-planning has been adopted by a range of organisations, and features in the modelling of risk and to identify errors. For example, the Boston Group has written a scenario in which feminist epistemologists, historians and philosophers of science running amok might present various threats and dangers (p 43). More recently. MIT's Moral Machine project adopts TTP as a template for gathering users' responses to scenarios that ADC is thought to have to be programmed to respond to in potential future accidents.

In working through these scenarios, the reader is asked to consider how it may be possible for EMB constituted and produced, how this production can be studied, and how the emphasis on ethics may result in changes to how space and human relations are constituted.

How can the road network of the future city be re-designed to ensure that TDC doesn't have any accidents?
Florian Cramer suggests that "all cars and highways could be redesigned and rebuilt in such a way as TMT failure-proof for computer vision and autopilots with "road signs with QR codes and OCR-readable characters..straight[ening] motorways TMT perfectly linear." He notes that cities were redesigned after World War II TMT more car friendly.

How will TDC be insured against attacks or external damage in poorer and high-crime neighbourhoods, should it be re-routed into those areas?
Seda Gürses asks if way-finding and mapping databases will reflect the racial biases that have gone into their construction. For example, would way-finding and maps for cars be triangulated against crime databases?

Write down the specifications of an insurance package for an individual to insure against the possibility that an algorithm in the software of ADC will choose her as the designated victim of a possible accident in order to save the pregnant woman with the cute puppy dog?
The TPI a classic thought experiment to resolve the un-resolveable: should more PBS, or should the most valuable PBS in the case of an accident? The TPI being projected as the way to think about EID cars.

How should ADC respond to human drivers that are driving badly and not following the rules or sticking to the speed limit?
Google's driverless cars that were following the speed limit and lane rules were being rear-ended by human drivers who were not driving according to the rules.

How can TDC take care of a pedestrian it may accidentally hit?
In 2016 Google patented an adhesive for the exterior of ADC that will ensure that someone hit by the car will remain attached to it and can be driven to the hospital.

How is the mapping software in TDC to be updated to reflect changes in the earth's geography?
Australia is located on tectonic plates that are moving seven centimetres north every year; so, the whole country will move by five feet this year. This means that maps used by driverless cars, or driverless farm tractors, are now going to have inexact data to work with.

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Glossary

This text has been filtered with the "Acronymizer", which finds repetitive phrasings in a text and builds a suggested glossary.

ADC : A DRIVERLESS CAR
ASO : A SET OF
DCI : DRIVERLESS CARS IS
EID : ETHICS IN DRIVERLESS
EMB : ETHICS MAY BE
IDC : IN DRIVERLESS CARS
OAD : OF A DRIVERLESS
PBS : PEOPLE BE SAVED
TDC : THE DRIVERLESS CAR
TEI : THAT ETHICS IN
TMT : TO MAKE THEM
TPI : TROLLEY PROBLEM IS
TTP : THE TROLLEY PROBLEM

SPEED READING AND LIMINAL TYPE: ABSORBING CONTENT

Sam Skinner and Nathan Jones

This text by Sam Skinner and Nathan Jones (torquetorque.net) describes and explores the implications of speed readers, and their intermixture with graphically reduced type faces. It is presented here in a form intended to evoke, and perhaps remediate, the speed reader form.

A 2015 Honda advert used speed reading to invoke a relation between an ability to "push harder", evolve reading ability, and Honda's innovative car-making. The advert was banned in the UK after only a short showing, because it was deemed irresponsible for a company to make "speed" the central theme of a car advert.

Speed reading applications reduce words that bodies of text, once displayed sequentially, one after the other, and when a whole length of text is read, retain the faces of specific eyes. Rapid Serial Visual Presentation (RSVP) of text enters, to increase reading speed from 100 to 1000 words per minute. RSVP does this in part suppressing the need for visual system to perform eye-saccades. "natural" reading, then reading moving your eyes, scanning place of words within perceptual RSVP, to back again, the scientific listening in, the called the, skilled listening of the throat. Limits.

These physical components of reading might be considered wasteful, and furthermore present a number of obstacles to *pure* reading. For example, many reading disorders are associated with a failure to perform efficient eye-saccades, rather than any issue with character recognition or interpretation. This poses the question : Although the modern brain has been trained into a concentration of singular focus, do the eyes themselves retain an integral archaic distraction? Speed reading apps like Spritz and Spreader describe the process of scanning back and forth across a page itself as "disorderly" or "unnatural".

So increased speed of reading is only one of the possibilities afforded by RSVP. Commercial apps like Spritz and others like it, appropriate and redirect the science of optimal viewing position toward fluent, fluid, immaterial experience of text, claiming to smooth over disorders. Spritz declares on its website that : "You'll find that you will be able to inhale content when you regain the efficiencies associated with not moving your eyes to read. And you will no longer move your eyes in unnatural ways." A new natural then. As Colin Schultz writes on the smithsonian.com blog, "the process feels less like reading and more like absorbing the text."

Within the format of this publication we cannot show you speed reading, and the text here is far from its vaporous form. Perhaps it is boiling though. If it were a flick book with one word on each page then perhaps it might evaporate. Instead, here every space is replaced by a carriage return. But it's an evocative approximation. Right? No? You're reading down, down, down, dropping, guided by the plumb line of structural rules governing the composition of clauses, phrases, and words in natural language (though you could read in other directions, along other lines.) With RSVP, you go down into the temporal depth of the screen. And a repetition deeper deeper deeper would simply be a pause in the action of transformation from one word to the next. Deeper remaining there for three frames, as the heart beat of the text stops.

Speed (reading), incidentally, can be slow and fast. Speed merely refers to a replacement of the spatial dimension with a temporal one. As with the difference between the billboard and the receipt, speed arrives with a huge amount of latitude. Stationary and blurred words mark the extremes of this dimension. As well as raising interesting conceptual questions, the speed reader asks new things of our bodies and minds. It can push against and cut across our physical and cognitive capabilities, amplifying some physical responses, such as blink reflexes and iris contractions, over others, such as subvocalisations. The same can be said of the cognitive. How does rhythm, frequency, enter into the semiotic regime now? What is reading-watching? Is this text happening to us, rather than us happening to it?

There seems to be an urge to politicize these questions, this new medium. Are speed readers a symptom of semiocapitalism, for example? Perhaps only if you read too fast, or do not use your new-found spare time to sufficiently free your mind? Perhaps also they are a cure for a disorder invoked by semiocapital machinations? A cthonic pharmakon? We would like to form a theory and practice with speed readers that is resistant to narratives of continual accelerations and efficiency, even as they appear to be a metonym for this very trajectory in the contemporary environment.

Liminal Type
The typeface (pictured) Skinner designed for a speed reader accentuates areas where contours intersect. It engages with the notion of text's evaporation. Perhaps it relative lack of materiality compared to these letters here, might make it easier to absorb or for it to absorb us. The liminal typeface is both easier and more difficult to read. It is influenced by the work of Mark Changizi which describes how all human visual signs, from letters to houses, icons and logos to maps and dry stone walls, possess a similar signature in their configuration distribution. This suggests there are underlying principles governing their shapes. He provides an ecological hypothesis : that visual signs have been culturally selected to match the kinds of conglomeration of contours found in natural scenes. Perhaps because that is what we have evolved to be good at visually processing

skills developed for orientating ourselves through landscapes or divining fruitful trees, for example.

The neuronal recycling hypothesis developed by Stanislas Dehaene, similarly implies that our brain architecture constrains the way we read with reference to more "natural" or fundamental encounters with shapes. Dehaene argues that our cortex did not specifically evolve for writing, rather, writing evolved to fit the cortex and to be easily learnable by the brain. A massive selection process, where over time, calligraphers, writers, designers developed evermore efficient notations that fitted the organization of our brains.

So words look the way they do because of nature – traversing and born between external landscapes and internal networks. This is a reading of the brain itself as a renewable materialism, which we find deeply enticing, particularly in relation to the notion of textual evolution embodied and vaporised in speed reading. Reducing conglomeration to its fundamental core, the Torque Liminal typeface accentuates only the areas where lines intersect. It is part of a tradition of typefaces in which the marks are reduced to their bare-life, least-lines, finest, lightest form. Hanging in the balance between non consciousness and consciousness, the liminality of the type evokes a forest at night, just as

the speed reader interface can invoke vertigo, nightmares or panic.

We finish this project precipice with questions If this is (more than ever) a post-human time, and literature is co-evolving with and folding into technics, is there a hard-fork literature, a hard fork humanity at the point of speed readers? One perhaps that somehow replicates the temporal aspects of language orality, through the shifting visual field of landscape? Is the speed reader the glitch at which we dissolve back into landscape as reading-beings? Or can speed reading be used in such a way that it accentuates the fundamentally humane, suffering, subvocal and involved physiology of reading? Can underexplored potencies in temporal text be deployed to re-engage the throat, the eye, the

hand, the empathic connective tissue-echo between reader and writer?

Do the surprising conceptions of legibility and readability within speed reading and liminal type afford new possibilities for content, typography and the physical-cognitive relation in reading? Where do the lower limits of legibility lie, the need for speed? The withering of graphical marks? Or vice versa, the slowness of horizontal reading, the heaviness of type? In a sense are we, with the horizontal page, already at the furthest degree of "unnatural" reading? Are our abilities to absorb information from conglomerations of lines already suppressed into their most contorted form, waiting to spring back to archaic, unfocussed, fundamental efficiencies? What do machinic systems of computation and display enable, awake, replace, or stupefy,

and how in turn does this affect our reading of and with the world?

Finally, now machines are learning to read, will we read to or through or with them?

MACHINE PEDAGOGIES

Nicolas Malevé

The process of training an algorithm binds together learning and alienation. The agencies of the human worker and the algorithmic agents are both reduced and impoverished. The human worker is insulated (from her co-workers and from the algorithm she is preparing the "intelligence"), her margin of interpretation is narrowly defined and the indecent wage forces her to a tiring rhythm of work (see appendix 1). The algorithm is trained as an animal in a lab, receiving signals to be interpreted unequivocally and rewarded or punished according to the established ground truth it cannot challenge (see appendix 2). If the teaching of machines implies a reflexion about liberating practices of pedagogy, where should we look for inspiration?

Paulo Freire's The Pedagogy of the Oppressed proposes a few useful principles.
For Freire, it only makes sense to speak of pedagogy in the perspective of the liberation of the oppressed (Freire, 1969). Freire sees his pedagogical method as a way for the oppressed to learn how to change a world made by and for their oppressor. A first concept is what he calls the "banking" pedagogy. The oppressor imposes a world in which only the members of a certain class have access to knowledge[1]. The others merely have the right to assimilate passively a never ending recital: Lima is the capital of Peru, two and two make four, etc. Learners are empty entities where their masters make the "deposit" of fragments of knowledge. Their empty brain is filled with the oppressor's content. But the masters are not interested in the productive use they may make to improve their condition. What they have to learn is to repeat and reproduce. The knowledge "desposited" by the oppressor remains the oppressor's property. Freire's own pedagogy proposes the opposite. For him, the oppressed never comes "empty" of knowledge and the educational process has to make the learner realize he has already produced knowledge even if this knowledge doesn't count in the traditional pedagogical framework. This leads to a second point. The humanity of the subject engaged in a pedagogical relationship should not be taken for granted. The subject comes alienated and dehumanized. The category "human" becomes problematic and it is only through the process of learning that humanization takes place. The oppressed is made of the oppressor and has internalized his world view. What counts in the process of humanization is to get rid of the oppressor inhabiting the oppressed. Freire insists on the fact that a teaching that would fail in the process of helping the learner to free oneself from the oppressor's world view, and merely let him acquire more power through knowledge will fail to create a revolutionary subject. It will create better servants of the current oppressor or, worse, new and more efficient oppressors. The third book's striking point is the affirmation that nobody is a liberator in isolation and that nobody liberates oneself alone. Liberation through pedagogy always happens when the learner and the "teacher" are mutually liberating each other. There is no idea a priori of what the liberation pedagogy should be. Both entities are learning the practices that will lead to freedom from the relationship itself.

Let's revisit the methods of machine learning using these principles to articulate prospective questions.
Freire considers the relationship between the learner and the teacher as an opportunity of mutual liberation. To apply this to machine learning, we need to acknowledge the fact that both the people who teach machines and the machines themselves are entrapped in a relationship of oppression where both are loosing agency. To free algorithms and trainers together, both need to engage in a relationship where an iterative dialog is possible and where knowledge can circulate. This suggests to examine with great scrutiny how this relationship is framed and scripted. For instance, the data collection from human workers and the "ingestion" of the data by the algorithm are two distinct processes separated in time and space. Making it impossible for a dialogical relationship to happen. How to reconnect both processes and make machine learning become a dialogical process from the start? Freire doesn't take for granted that a learner is "human" when he enters a pedagogical relationship. He only follows a process of humanization when the relationship unfolds. This resonates with a certain discourse in Artificial Intelligence[2] that softly erodes the human/machine divide as the algorithm learns. What is different is that Freire insists on maintaining the human/non-human demarcation. He doesn't make the distinction on an a-priori ontological quality of the beings but on their trajectory of liberation. What matters is how much human and machines are able to fight their common alienation. The core of the learning activity lies in a form of reflexivity where one follows a process of humanization through which he manages to get rid of the oppressor inside. We can then ask: "what kind of machine reflexivity can trigger human reflexivity and vice versa?". And how this cross-reflexivity may help identify what constitutes the oppressor inside. This leads us to the banking principle, according to which the oppressed is considered as an empty entity where knowledge is stored and repeated. This represents a complete erasure of what the learner already knows without knowing it. What does the trainer doesn't know he knows? What does the algorithm doesn't know it knows? What they both ignore, Freire would say, is their own knowledge. And to which extent this knowledge unknown to them is the knowledge of their oppressor or their own. To answer these questions they have only one choice: to engage in a dialog where two reflexivities are teaching each other the contours of their alienation and at the same time how to free themselves from it.

Notes

[1]: See Freire's insistence in addressing this question as a political problem rather than an ontological one in his discussion with Seymour Papert:
http://www.papert.org/articles/freire/freirePart2.html (Proximus NV ⇝ RIPE Network Coordination Centre ⇝ Telia Company AB ⇝ Amazon.com, Inc. ⇝ Amazon.com, Inc.)
[2]: See Fei Fei Li's Ted Talk How we teach computers to see, https://www.youtube.com/watch?v=40riCqvRoMs (Proximus NV ⇝ Google Inc.)

Appendix 1

A worker connects to the Amazon Mechanical Turk (AMT)1 and selects an image annotation task2. She faces a screen where a label and its definition are displayed. When she confirms she has read the information, she is shown another screen where the label is followed by different definitions. The workflow is regularly interrupted by such control screens as her requester suspects her to work without paying enough attention. When she clicks on the right definition, a list of 300 square images is displayed from which she has to select the ones corresponding to the label. When she decides she has selected all the appropriate images, she continues to her new task. The list of images she chooses from contains "planted" images. Images that are known to the requester to correspond to the label. If the worker misses the planted images, her task will be refused and she won't receive the 4 cents the requester pays for it. At least three workers will review the same 300 images for the same label and the images selected by a majority of them will be included in the dataset. The worker will not be notified if her selection matches (or doesn't) another worker's selection. She works in isolation and anonymously.

Appendix 2

The images and their labels are grouped in classes of objects. A learning algorithm is fed with these data and trained to associate a label and a series of images. It will be shown a series of images containing both matching and non-matching objects. It will be "rewarded" or "penalized" whenever it detects appropriately in the images the object corresponding to the label. Every interpretation that doesn't correspond to the truth stated in the training set will be considered an error. It will be retrained multiple times until it finally matches the most successfully the images according to the ground truth. It is a very mechanistic approach to training. The machine is rewarded when behaving properly and reinforces the kinds of associations that lead it to produce the satisfying answer. It is expected from it to exhibit the proper behavior, not to create a rich internal representation of the problem it needs to solve.

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Kobielus J (2014) Distilling knowledge effortlessly from big data calls for collaborative human and algorithm engagement, available from http://www.ibmbigdatahub.com/bl og/ground-truth-agile-machine-learning [accessed 10 October 2016]

Seymour Papert and Paulo Freire Debate Technology and the Future of Schools, available from https://www.youtube.com/watch?v=4V-0KfBdWao [accessed 08/01/2017]

Readme

"From Page Rank to Rank Brain" is an essay that attempts to "decloak" as well as "update" public knowledge about Google a.k.a. Alphabet's ranking algorithm. This text has then been altered through [3] "translation" processes.

Drawing on Constant's collection of scripts,[1] the first translation (a) used "encryptionlinessha1.py" that "provides the ultimate reduction (although at the expense of human as well as machine legibility) by encrypting every line of your text as a 128-bit hash value. Each hash value can of course be reversed again if you try to match it with every single line of every single text existing."[2] The second translation (b) uses a little python script called the "The Synonymizer" that corrupts your writing style by swapping out words in your text with randomized synonyms from WordNet.[3] With the third translation (c), the text was first read with the "text to speech" voice of "Alex" and saved as an audio file, then uploaded to "gentle", a robust yet lenient "forced aligner" built on Kaldi.[4] Forced aligners are computer programs that take media files and their transcripts and return extremely precise timing information for each word (and phoneme) in the media. How does it work? "As in all of these Machine Learning cases, you have to follow the data."[5]

Notes

[1] https://gitlab.constantvzw.org/machineresearch/reduction/tree/master/filters (Proximus NV ⇸ OVH SAS)
[2] In cryptography, SHA-1 (Secure Hash Algorithm 1) is a cryptographic hash function designed by the United States National Security Agency and is a U.S. Federal Information Processing Standard published by the United States NIST in 1993. SHA-1 produces a 160-bit (20-byte) hash value known as a message digest. A SHA-1 hash value is typically rendered as a hexadecimal number, 40 digits long.
[3] "Note:it may also corrupt the meaning of your text which replaces 'choice words' with synonyms." WordNet: http://wordnet.princeton.edu/. (Proximus NV ⇸ Hurricane Electric, Inc. ⇸ Princeton University) Thanks 2 Dave Young
[4] http://lowerquality.com/gentle/ (Proximus NV ⇸ Level 3 Communications, Inc. ⇸ Advania hf. ⇸ Thor Data Center ehf)
[5] In this case, it's the CALLHOME corpus, which is 120 unscripted 30-minute telephone conversations between native speakers of English in the 1990s. https://catalog.ldc.upenn.edu/LDC97S42. (Proximus NV ⇸ Cogent Communications ⇸ University of Pennsylvania) Thanks 2 Robert M. Ochshorn

FROM PAGE RANK TO RANKBRAIN

The Synonymizer (b)

Page rank to heighten page concept page social station receive information technology basis in scientific citation index a form academic hierarchy hour angle now be transplant as a conceptual paradigm way detect information information be prioritize u.
Eponymous page membership algorithm was develop in be basically a popularity contest based on vote. Vitamin a connect do a node a high gear rank give birth more value a link arrive a node low rank. Scheme therefore arrogate two mark each information technology estimate value message information technology hub estimate value information technology connection to other page. Five hundred.
Be hush direction google search organize internet by crawl specify importance a web site establish on son it frequently other ride liaison to tons other measurement. Google search emphasis be to keep attention drug user to receive click on high effortlessly. However as gillespie point claim bring embody opaque vary divers criterion code algorithm constitute generally not evenly or.
Based on location search seeker equal through a set criterion. Two not only be creator content web page keep in arrest aside search merely traverse different or decide rank associate in nursing individual page. Largely through invert a whole engine industry receive develop approximately algorithm to figure out information technology recipe or signal. Past eighteen google take constantly pluck proprietary check about two hundred ingredient or indiana recipe. Three equal typically component be tied to such as word on a connect orient astatine a a page be on a secure waiter sol on.
Can besides be bind to a such as a searcher equal locate or search shop history. Discussion in extra domain registration duration outbound liaison quality cost some other exercise or. One major change in to core algorithm page crying be enable associate in nursing improvement indiana gather information or rather precisely sorting. Was associate in nursing update was implement in be think low enabling high choice foliate to heighten.
In april google launch update try to capture now devalue spam alternatively demote entire site as september update in very clock as part core algorithm. Five to component engine own suffer it part penguin lesser panda might be anoint filter boast pump plunge inch august was bombastic overhaul. Introduction a brand newly engine emphasis have shift to contextual less now about more about purpose behind it semantic capability be at impale. Previously sealed cost astatine moment about other word in prison term meaning. Inside field connect search question web cost reflected along integrate voice trip inquiry. Hummingbird be new google locomotive belated surrogate part be then.
Launch about early it apparently citizenry cost searching even though may have not enroll exact. Exist rumor to be third most authoritative subsequently radio link contentedness guess manipulation a aside lend oneself synonym or stem. Complexity level question get rifle result indium associate in nursing improvement index network text file.
Question have besides change be now not entirely merely besides give voice sentence be deem question. Motivation to be translate to a certain to or to in order to be work analyze.
Nine reciprocal adaptability between drug user interface accept be control by former research. Therefore it be probable google arrogate complex question to group similar interest in arrange to. Ten learn be not always neutral.
Build aside use aside bias hang-up off on engineering.
Code can discriminate.
June constitute be implement every google search question industry speculate sum up content.
Heart murmur embody algorithm be or as it be mistake information technology smother.
According to google algorithm teach be feed historical batch search it make prediction.
Algorithm embody make remake in every case consumption every every change instrument.
Hertz be constantly repeat prediction be late adaptation adam hot.
Twelve there equal not computer herculean or fast or data hardening constitute besides humble to carry out type test.
Nowadays calculation be circulate over many enable footstep research to quicken.
Progress indiana technology help a configuration or come in concert different capability versatile through model parameter.
Finally or in case exist able to through repetition.
Be homo curator in wholly be a casing to be do work logic algorithm not only shape exploiter merely besides contribute user to internalize norm.
Wonder then be to extent be there human adaptation to algorithm in trickle or much dress algorithm affect homo learning not merely discrimination merely besides agency toilet be catching.

FROM PAGE RANK TO RANKBRAIN

Gentle (c)

mhm i'm from a drunk to rent graeme p.r. a. eagles will be close to be pretty or do you want to be do one plus plus p.r. e. d. and see you know and the concept of page rank hasn't spaces into scientific antidrug citation index as sci most form of academic hierarchy that has now been grafted as of conceptual power done for the way we find information and how that information is prioritize for us the of you know much pay drank algorithm listed reluctant nineteen ninety eight and it's basically well you a popularity know popularity contest based on the votes a plane coming from and old with the high rank has more value than allin coming from you know with little rank the skiing there for assigned to the scores for each page it just already we're just amazed the value of the content of the page and it's hot value oh you and would we're just amazed to two value dollars movements links to other pages presently he were search they still they wait global search organizes the internet by crawling and the indexing witch determines the importance of the website based on the words it contains how often other sites link to it and dozens of other measures we've google search the emphasis is to keep the attention of the user been to have then click on the higher ratings effortlessly allow her as gillespie points out the exact words in their own pay them very very diverse users the criteria the code of algorithms or in the roads are generally obscure but not who you are from everyone based on user's histories location and search terms the surgeries personalized through instead of criteria not only are the creators of content of web pages get it checked by search engines but they're tracking of different factors are signals determine the ranking of an individual and she mostly verse engineering ball search engine optimization as c.e.o. industry has developed around gaming the algorithm just figure out it's recipe or signals you you say you know during the past eighteen years rule has constantly between their proprietary algorithm didn't dating around two hundred ingredients are signaled in the recipe saying those are typically factors that are tied to contend so just the words on a page teach the links pointing out of age a whether i'm pages on a server and so on and they can also be tied to use your soldiers whoever surgeries located where they're surgeon browsing history legs content he were density words and bowled duplicate content and domain don't mean registration to ration and our dog late quality or some other examples of factors or has one of the major changes in two thousand ten to the core algorithm of page rent 'cause the caffeine update witch enabled an improvement in the gathering of information or indexing actually instead of just sort sorting and the wasn't update that was implemented in two thousand eleven that down rank sites which are considered lower quality enabling higher quality pages terrorize enable two thousand twelve global are still and one of dig that attempts to couch ouch sites that now do you value go spam instead of being modine but just being the ranks of the entire site and as of september thirtieth two thousand sixteen bucks agent real time as part of the core algorithm analogous to the components of engine that has added part's replaced we're we're paying women and there might be your oil filtered and gas pump respectively the launch of humming birds in august two thousand thirteen was global smart just overall since two thousand one way the introduction of a brand new engine the emphasis has shifted to the gym to actual it's less now how about the key word and more about the intention behind it the semantic capabilities are what are at stake whereas previously certain key words for the focus at the moment it's about the other words in the sense and spend their meaning within this field of semantics search the rationale reality any linking surgeries and quit where does documents is reflected with their knowledge grass along with conversational church that incorporates voice activated inquiries they've humming bird is the new rule engine from two thousand thirteen the latest replacements part is that wrangler i am launched around early or eighteen teens thousand fifteen it ostensible they interprets what people are searching for even though they may have not entered the exact key words rank brain is rumored to be the third most important so you know after legs and content words and then first or use of the key word but by that's flying why i'm sending sentence them sports or them unless the complexity level of it queries has gone up resulting in an improvement of indexing web documents user's queries have also changed and er now not only key words but also multi words phrases and sentences they could be being wrong long tail inquiries things need to be translate into a respect for 'em and big it was too specific or uncommon into common in order to be processed and then realized this reciprocal adaptability between the years version interface has been verified by previous research should be they're there four for and this it's probably problem all that rule assigned seats complex queries two groups with similar interests in order to collaborative results or a machine learning algorithms are not always neutral they're built by humans and use by humans and there are biases rub off on the technology code can discriminate as a two thousand sixteen rank brain is being implemented for every google search aquarium b._s. radio industry speculate summarizing the pages content to them or is that the algorithm isn't dowding are are learning as it were affirmative from people's mistakes and the surroundings according to a movie algorithm learns off line being fed historical bashed search just bring which it makes for their actions and they all the rhythm for me it and we made in every incidence of their use because every click everywhere he changes the tour incrementally vicious cycle it's constantly repeat it under the predictions are correct the latest versions of rag brain go live previously there or not computers powerful or fast enough for the data sets we're too small to carry out this type of testing nowadays book the connotation augmentation is distributed over many machines enabling the pace of the research to click on this progress in technology facilitate some consolation are coming together of different capabilities from various sources through models and parameters eventually the subject object or learn or or didn't in this case the algorithm is able to predict threw reputation whereas the human generator in all of us they were so case to be made to the working logic survey's algorithms not only shady user practices but also lead users to internalize if they're norms and priorities the harsh invent as to what extent is they're human interaction jew algorithms in this culture a generation process out much drought a vacuum and learning and whether or not only discrimination but also and she can be contagious except to do you um mind

encryptionlinessha1.py (a)

a1e1c6be7dda0e1637f704febcc46fc0d7c11bd8
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
18435c50442c4752e18ce421cf5b6d7637b14db0
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
7e788fb56bd7b3218df2d92660726f809a3ff4bf
0504b125ca32b43609178b54615d0e977133aa45
e165e4d16cfd2cf0a8ae8840e1ddbd23218229fb
767de1876198f54c5d89bf6fd400438597fe962c
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
089035a38e79247542f9f947c526b46dca76aa8f
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
2f13fd3f48e6332dd81c38752e23bf0d291fa222
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
302c19c13e1da293bae24441a322fd191b5ea7f2
c2724665d03ca72a4368ebea907285d8c4c87f10
c59ef8e41e404f221913dce8312bbadd86fb7722
93b17cbe3d16a4ace1839c1aca76d6aac8217f2a
b46eb56e7d5d55999cc9889141d3d49aec67ca85
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
d73a4a559b0f0598ebf2720fa9433c1339f051c4
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
8fa99a8df73bd92db3ca267d5f2efe46055cba13
ba8ab5a0280b953aa97435ff8946cbcbb2755a27
c6b1f0f6ed0bab101f7bb77b2afbc35a5a43013c
2ed26a3a9b069e3ad443d066fc6823a73524c9e4
d0cbfc8101b6f8c71a755a2f2556ca5396f8e1c3
2a1b3d3187e202cdb85d9c9af2946d82cd1048bd

FROM PAGE RANK
TO RANKBRAIN

Renée Ridgway

The concept of Page Rank has its basis in the Scientific Citation Index (SCI), a form of academic hierarchy that has now been grafted as a conceptual paradigm for the way we find information and how that information is prioritised for us. The eponymous Page Rank algorithm was developed in 1998 and is basically a popularity contest based on votes. A link coming from a node with a high rank has more value than a link coming from a node with low rank. The scheme therefore assigns two scores for each page: its authority, which estimates the value of the content of the page, and its hub value, which estimates the value of its links to other pages.

$$PR(A) = (1-d) + d\ (PR(T1)/C(T1) + ... + PR(Tn)/C(Tn))$$

Secret recipes

Presently, "keyword search" is still the way Google Search organises the internet by crawling and indexing,[1] which determines the importance of a website based on the words it contains, how often other sites link to it, and dozens of other measures. With Google Search the emphasis is to keep the attention of the user and to have them click on the higher rankings, effortlessly. However as Gillespie points out, the exact workings are opaque and vary for diverse users, "the criteria and code of algorithms are generally obscured—but not equally or from everyone" (Gillespie 185). Based on users' histories, location and search terms, the searcher is "personalised" through a set of criteria.[2] Not only are the creators of content of web pages kept in check by search engines, but the tracking of different factors, or signals, determine the ranking of an individual page. Mostly through reverse engineering, a whole "Search Engine Optimisation" (SEO) industry has developed around "gaming" the algorithm to figure out its recipe or signals.

Signals

During the past 18 years, Google has constantly tweaked their proprietary algorithm, containing around 200 ingredients or "signals" in the recipe.[3] "Signals are typically factors that are tied to content, such as the words on a page, the links pointing at a page, whether a page is on a secure server and so on. They can also be tied to a user, such as where a searcher is located or their search and browsing history."[4] Links, content, keyword density, words in bold, duplicate content, domain registration duration and outbound link quality are some other examples of factors, or "clues". One of the major changes in 2010 to the core algorithm of Page Rank was the "Caffeine" update, which enabled an improvement in the gathering of information or indexing, instead of just sorting. "Panda" was an update that was implemented in 2011 that downranks sites, which are considered lower quality, enabling higher quality pages to rise. In April 2012 Google launched the "Penguin" update that attempts to catch sites, and now devalues spam instead of demoting (adjusting the rank) of the entire site. As of September 30, 2016, it updates in real time as part of the core algorithm.[5]

Analogous to the components of engine that has had it parts replaced, where Penguin and Panda might be the oil filter and gas pump respectively, the launch of "Hummingbird" in August 2013 was Google's largest overhaul since 2001. With the introduction of a brand new engine the emphasis has shifted to the contextual — it's less now about the keyword and more about the intention behind it — the semantic capabilities are what are at stake. Whereas previously certain keywords were the focus, at the moment the other words in the sentence and their meaning are accentuated. Within this field of "semantic search" the "relationality linking search queries and web documents"[6] is reflected with the "Knowledge Graph,"[7] along with "conversational search" that incorporates voice activated enquiries.

If Hummingbird is the new Google engine from 2013, the latest replacement part is then "RankBrain". Launched around early 2015 it ostensibly "interprets" what people are searching for, even though they may have not entered the exact keywords. "RankBrain" is rumoured to be the third most important signal, after links and content (words) and infers the use of a keyword by applying synonyms or stemming lists.[8] The complexity level of the queries has gone up, resulting in an improvement of indexing web documents. User's queries have also changed and are now not only keywords but also multi-words, phrases and sentences that could be deemed "long-tail" queries. These need to be translated to a certain respect, from "ambiguous to specific" or "uncommon to common," in order to be processed and analysed.[9] This reciprocal adaptability between the users and interface has been verified by previous research. Therefore it is probable that Google assigns these complex queries to groups with similar interests in order to "collaboratively filter" them.[10]

Machine learning

"Algorithms are not always neutral. They're built by humans, and used by humans, and our biases rub off on the technology. Code can discriminate."[11]

As of June 2016 "RankBrain" is being implemented for every Google Search query and the SEO industry speculates it's summarising the page's content. The murmur is that the algorithm is adapting, or "learning" as it were from people's mistakes and its surroundings. According to Google the algorithm learns offline, being fed historical batched searches from which it makes predictions. "And algorithms are made and remade in every instance of their use because every click, every query, changes the tool incrementally" (Gillespie 173). This cycle is constantly repeated and if the predictions are correct, the latest versions of "RankBrain" go live.[12]

Previously there were not computers powerful or fast enough, or the data sets were too small to carry out this type of testing. Nowadays the computation is distributed over many machines, enabling the pace of the research to quicken. This progress in technology facilitates a constellation or coming together of different capabilities from various sources, through models and parameters. Eventually the subject, or learner, in this case the algorithm, is able to predict, through repetition. Where is the human curator in all of this? "There is a case to be made that the working logics of these algorithms not only shape user practices, but also lead users to internalize their norms and priorities" (Gillespie 187). The question then is to what extent is there human adaption to algorithms in this filtering or curation process, how much do algorithms affect human learning and whether not only discrimination but also agency can be contagious.[13]

References

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Page, Lawrence and Brin, Sergey. The Anatomy of a Large-Scale Hypertextual Web Search Engine (1999). Web. http://infolab.stanford.edu/~backrub/google.html (Proximus NV ⇸ Hurricane Electric, Inc. ⇸ Stanford University)

Notes

[1] Since 2013, Google.com is the most visited website in the world, according to Alexa. "Google processes over 40,000 search queries every second which translates to over 3.5 billion searches per day and 1.2 trillion searches per year worldwide." In 1999, it took Google one month to crawl and build an index of about 50 million pages. In 2012, the same task was accomplished in less than one minute. 16% to 20% of queries that get asked every day have never been asked before. Every query has to travel on average 1,500 miles to a data centre and back to return the answer to the user. A single Google query uses 1,000 computers in 0.2 seconds to retrieve an answer. http://www.internetlivestats.com/google-search-statistics/. (Proximus NV ⇸ Level 3 Communications, Inc. ⇸ Colo4, LLC ⇸ PrivateSystems Networks)
[2] No space here to elaborate, please see Personalisation as Currency: http://www.aprja.net/?p=2531 (Proximus NV ⇸ NORDUnet ⇸ RIPE Network Coordination Centre)
[3] Google usually describes that is has around 200 major ranking signals, yet there have been discussions of 1000 or even 10000 sub-signals. http://searchengineland.com/bing-10000-ranking-signals-google-55473 (Proximus NV ⇸ Tinet Spa ⇸ EGIHosting)
[4] http://searchengineland.com/faq-all-about-the-new-google-rankbrain-algorithm-234440 (Proximus NV ⇸ Tinet Spa ⇸ EGIHosting)
[5] "Some sites want to do this because they've purchased links, a violation of Google's policies, and may suffer a penalty if they can't get the links removed. Other sites may want to remove links gained from participating in bad link networks or for other reasons." http://searchengineland.com/google-penguin-doesnt-penalize-bad-links-259981 (Proximus NV ⇸ Tinet Spa ⇸ EGIHosting)
[6] According to David Amerland, author of Google Semantic Search. http://searchengineland.com/hummingbird-has-the-industry-flapping-its-wings-in-excitement-reactions-from-seo-experts-on-googles-new-algorithm-173030 (Proximus NV ⇸ Tinet Spa ⇸ EGIHosting)
[7] Knowledge Graph was launched in 2012 and combines 'semantic search' information added to search results so that users do not query further. However this has lead to a decrease of page views on Wikipedia of different languages. https://en.wikipedia.org/wiki/Knowledge_Graph (https://en.wikipedia.org/wiki/Knowledge_Graph) (Proximus NV ⇸ RIPE Network Coordination Centre ⇸ Telia Company AB ⇸ Wikimedia Foundation, Inc.)
[8] In regard to information retrieval, 'stemming' is when words are reduced to their 'stem' or root form. "Many search engines treat words with the same stem as synonyms as a kind of query expansion, a process called conflation". https://en.wikipedia.org/wiki/Stemming (Proximus NV ⇸ RIPE Network Coordination Centre ⇸ Telia Company AB ⇸ Wikimedia Foundation, Inc.)
[9] http://searchengineland.com/faq-all-about-the-new-google-rankbrain-algorithm-234440
[10] http://firstmonday.org/article/view/3344/2766
[11] Victoria Turk. http://motherboard.vice.com/en_uk/read/when-algorithms-are-sexist (Proximus NV ⇸ Belgacom International Carrier Services SA ⇸ Amazon.com, Inc.)
[12] http://searchengineland.com/faq-all-about-the-new-google-rankbrain-algorithm-234440
[13] During the writing of my PhD I use Google Search for my research and have allowed myself to be personalized on my Apple computer without installing plugins, etc. that would attempt to prevent it.

netonets.py

Clicking on any link on the web sets in motion a request for information which travels from node to node, along a variable but predictable route, to reach the server that hosts the desired website. Once the server receives the request, its reply will flow back along roughly the same path to the browser. This exchange of information travels through just a few of the more than 50,000 different subnetworks that together constitute the Internet. The chosen route is determined by the Internet Service Providers that manage those subnetworks, depending on a series of conditions, including the geographical location of source and destination, the network traffic circumstances and the specific commercial deals between subnetworks - the so-called "peering agreements".

Accessing any website or service is experienced as qualitatively the same by the browser user, independently of the path that the information packets will take. However, the geographical routes, the providers involved and the infrastructure accessed can vary extremely from case to case.

This text is a README for netonets.py, a post-processor of sorts which searches information about what networks have been traversed in order to reach an external web resource. The resulting metadata is added next to the web-based citations, a process applied to the other texts in this journal. The aim is to include a few of the aforementioned situated aspects of networks, right next to the formal ubiquity and universality of a hyper-link. Ast the route taken to reach a resource always changes depending on the starting location, the metadata will vary accordingly. The link-analysis for this specific journal has been calculated from the Internet connection of the 25th floor of the Bruxelles World Trade Center, during the Machine Research Workshop hosted by Constant in October 2016.

usage

Synopsis :

```
cat original_text_file.txt | python net_o_nets.py >
annotated_text_file.txt
```

Example output :

traceroute, whois

The analysis of the route is performed using two fundamental tools which are commonly used to understand and diagnose computer networks: Traceroute and Whois.

Traceroute probes the routed path between your local network and a given destination and returns a list of points that constitute that path. This is shown by listing the Internet Protocol address of each router on the way. While this information might seem authoritative it is also contingent on what each specific network allows to be measured and might thus be incomplete.

Whois is a tool to look up ownership information about an Internet resource, as a domain name, an IP address or an Autonomous System. In order to register and use such a resource, a private individual, company or organization has to provide contact details to publicly accessible databases.

Whereas traceroute obtains the logical adress of each node that forms our abstract path through the network, whois turns this information into a story of a network of networks, with different owners, material conditions and legacies. Using the two in conjunction reminds one of the aspects of ownership, power and control that come with the participation on a network that is usually perceived as open and horizontal. At the same time this simple move offers a ground to talk about network politics at an approachable scale, by looking at a specific moment, location, set of agents and operations.

freedom, autonomy, peerage, tiering

The entanglement of different networks that the Internet is composed of is based on the fundamental element of the IP protocol, which was designed for autonomous inter-operation and dynamic restructuring of the network without a central management center. While on the first experimental inter-networks any machine on any network could directly address any other machine on any other network, the change of scale and complexity due to the global success of the Internet also meant the practical dismissal of flat hierarchies. The different networks are currently articulated around the concept of 'Autonomous System', the subnetworks that compose the Internet, managed by one organization or company, and in which all communications follow the same routing table. This means that to reach an Internet resource, all the nodes in an Autonomous System agree on which network one packet has to hop next, to move towards a destination. The current system admittedly keeps a degree of openness and horizontality. The routing tables are free to access, so that each AS is able to check the other AS's routes and decide which ones are convenient to hop to, to assure efficient flows towards all possible destinations. This technical cornerstone of the Internet, according to certain ideological readings, should guarantee an inherent freedom and openness of the network. We can genuinely acknowledge the free aspect, as long as it is understood in the sense of capitalist market freedom: horizontal participation in the Internet is open to all parties with the economic means to acquire the necessary infrastructures and sign peering-agreements with neighbouring networks.

Peering-agreements are a good example of the way horizontality and openness are perfectly compatible with inequality and de-facto hegemonies. While the word "peer" suggests an equality of sorts, in practice some peers are more equal than others. In order to "peer", smaller networks have to pay transit fees to larger networks. This produces a hierarchy which is referred to as the system of "tiered" networks. At the top of the hierarchy are the networks which do not need to pay to interconnect with any other networks because of their size and geographic spread, the so-called "Tier 1" networks.

Tier 1 networks are interesting entities through which we can understand the legacy of past networks on the ones of today. While there is no definitive list of Tier-1 networks, most listings include the same set of companies. What stands out is that most of these companies are the heirs of the old national telecom monopolies in Europe, or of the AT&T monopoly in the U.S. These firms gained this status due to their previous global activities and their historical role in interconnecting various continents: their status is a legacy of the times when these firms where part of colonial and imperial projects. Another thing that stand out is that there are no non-Western Tier 1 networks.

While probing the network, as one keeps returning to the same large transit networks in order to reach geographically disparate destinations, the "centrality" of Tier-1 providers becomes noticable. This script is a simple example of the short diversions one can take from the uniformed experience of internetworked telecommunications, to remind ourselves of the material conditions and the power relations that are implicated in each and every use of the Internet.

UNTIE : SOLVE : DISSOLVE RESOLUTIONS

Rosa Menkman

The term "resolution" is a determination of functional settings in the technological domain. While the term is often conflated into a standard numerical quantity or a measure of acutance, such as samples per inch, the term also entails a space of compromise between different actors (objects, materialities and protocols) in dispute over norms (frame rate, number of pixels, etc.). Generally, settings either ossify as requirements and de facto standards, or are notated as standardized norms by organizations such as the International Organization for Standardization (ISO). A resolution - or rather the resolving - of an image thus means more than just a superficial setting of width x height, or frames per second.

Besides a width and height, a screen also has a "thickness" and "depth" (Gonring, 2011). This thickness of the screen acts as a membrane, that shrouds the technology from its audience, while its depth can be understood as the space where protocols behind (or beyond) the screen organize settings, that in their turn inform the image politically, technically and aesthetically. Resolutions should be understood as a trade off between these standard settings; actors (languages, objects, materials) that dispute their stakes (frame rate, number of pixels and colours, etc.), following set rules (protocols).

The more complex an image processing technology is, the more actors it entails, each following their own "protocols" to resolve an image, all influencing its final resolution (think: liquid crystal, CPU, compression, etc.). However, these actors and their inherent complexities are positioned more and more beyond the fold of everyday settings, outside the afforded options of the interface. This is how resolutions do not just function as an Interface Effect (Galloway, 2012) but as hyperopic lens, obfuscating some of the most immediate stakes and possible alternative resolutions of media. When was the last time you saw or thought about a video with 8 or 3 corners? Unknowingly, the user and audience suffers from technological hyperopia. It has lost track of the most fundamental compromises that are at stake within resolutions. The question now is, have we become unable to construct our own settings, or have we become blind to them?

Determinations such as standard resolutions are as dangerous as any other presumption; they preclude alternatives, and sustain harmful or merely kippled ways of running things. This is why any radical digital materialist believes in informed materiality: while every string of data is ambiguously fluid and promiscuous, it has the potential to be manipulated into anything. This is how a rheology of data can take form, facilitating a fluidity in data transactions where actors themselves are at stake.
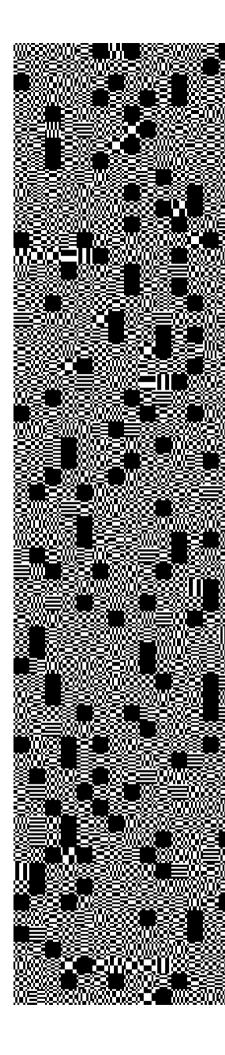
Resolution theory is a theory of literacy: literacy of the machines, the people, the people creating the machines, and the people being created by the machines. But resolution studies is not only about the effects of technological progress or the aesthetization of the scales of resolution; which has already been done under the titles such as Interface Effect or Protocol. Resolution studies is research about the standards that could have been in place, but are not - and which as a result are now left outside of the discourse.
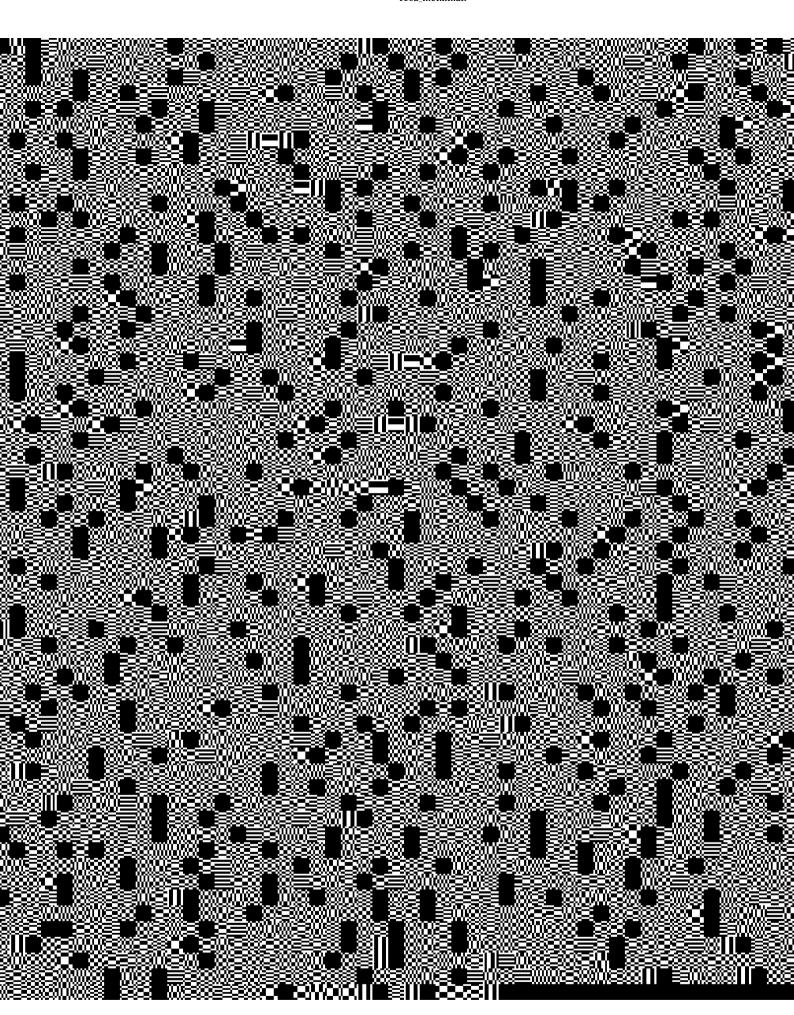
Through challenging the actors that are involved in the setting of resolutions, the user can scale actively between increments of hyperopia and myopia. This is why we need to shift our understanding of resolution as the setting of disputable norms, which compromise more and move actively to the setting of more diverse resolutions.

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IMAGING PROBABILITIES, IMAGINING POSSIBILITIES: MACHINIC PATTERN RECOGNITION
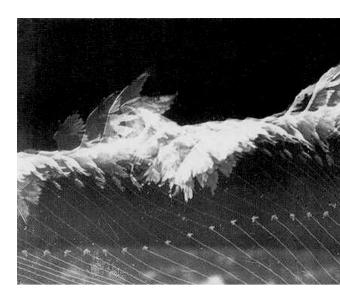
Søren Rasmussen

Representational meaning-making processes previously induced by traditional print culture have been replaced by the perpetual and modulatory processing of digital code in omnipresent, internetworked technology effectively affecting how we experience the world. Moving from analogue archives of motion capturing, preserving, and representing a moving world in its contemporary state, this shift is articulated as an anarchival paradigm to digital archives in motion (Røssaak, 2010; Ernst, 2013) operating in a time-space continuum imperceptible and inaccessible to the human sensorium. Previously appointed to the few, the construction and consignation of archived information today is delegated to the masses, as we participate like never before in mapping, tracking, and tracing our thoughts, bodies, and movements. This increase in participatory practices has paradoxically not sparked a new paradigm of individual expression, mutual understanding, and collective enunciation in which novelty and new relations can emerge, but has rather given way to neoliberal capture and reproduction of patterns through modulatory, programmed visions by means means of networked protocols (Chun, 2011; Galloway, 2004). We already live in societies of control (Deleuze, 1992) in which new technologies transform our lives, as we not only use but live with technology (Derrida, 1995, McCarthy & Wright, 2004). What happens when patterns are drawn in random data before human perception can make sense of it? What happens when nonsense is given meaning prior to pre-cognitive, affective perception?

In Matter and Memory philosopher Henri Bergson distinguishes between two kinds of perceptual recognition: automatic (or habitual) recognition and attentive recognition. Bergson argues that modes of recognition emerge from and extend into movement, but that the differences lie in how memory interferes. Automatic recognition continues and prolongs perception in an anticipation of the immediate future (e.g. recognising a chair is for sitting). Attentive recognition makes a cut in perception by dwelling on the perceived object and analyzing it by projecting resembled memories onto it (e.g. the contours of clouds resembling a face). Such interference by memory in perception will happen "until other details that are already known come to project themselves upon those details that remain unperceived" (2011: 123). This projection of memory upon perception can result in minor details that are blown out of proportion in the vivid imposing of meaning on random data (e.g. seeing faces in clouds), a tendency in human perception known as "apophenia" where the directed attention to minor details ends up defining the compositional whole.

The above machinic recognition of patterns in random data is also how much data analysis by digital machines is performed. Google's ambition to automatically classify images through their Deep Dream convolutional neural network is an example of patterning imposition that might result in unexpected outcomes much like human apophenia (cf. Steyerl, 2016).

Through machine learning contemporary computational processing is moving from an automatic recognition of data only to also encompassing an unconscious form of attentive recognition, as neural networks automatically and attentively transform data to fit the model they operate by. Always processing and always calculating probabilities this new form of governance is truly modulatory and preemptive in its algorithmic reproduction of patterns in data. By perpetually operating its algorithmic model on discrete data this new governance of modulatory control deprives us of the possibility of making a cut in the habitual, automatic recognition of patterns; it is actualising the world for us by imaging a world in terms of scripted protocols rather than allowing for imaginative leaps in counter-actualisations of what happens to us.
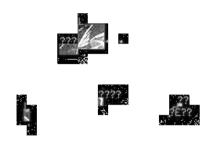

Image of a bird's flight captured and processed in discrete states by a chronophotographical gun. This image is further processed through optical character recognition using Tesseract API.

CAPTURING TIME AND PROCESSING MOTION

How do we then intervene in this continuity of algorithmic actualisation? How might the openness and potentiality in human nonsenseous perception and meaning-making processes be enriched by digital archival capture? A starting point is to offer alternative modes of digital thinking from big data analysis in which the actual analysis is not positioned with the digital machine in terms of offering probabilities, but instead offer new possibilities for the data to be reflected upon.

When Etienne Jules Marey operationalized the chronophotographical technique to capture a bird's flight in a series of overlapping images 150 years ago, he was not only depicting the movement of a bird, he was also mapping the durational change in movement. Marey was in a way picturing time and making the differential duration between the discrete data felt, as the chronophotography is not a tracing of time attempting to account for the bird's path, but a means to represent and thus make possible an analysis of change in motion.

Though often labeled as a predecessor to cinema, Marey's work is recognized by Stephen Mamber in its own right in terms of his capture of discrete data as means of analyzing intervals in movement thus being able to measure the forces that determine the movement rather than describing the total movement (2006). Rather than situating Marey's work within cinema's chronological continuity, Mamber recognizes the capture of discrete data as "a mode of digital thinking in that, by its very nature, it breaks down a continuous, on-going activity into a set of measurable, discrete components" (2006: 87).

In Mamber's link between chronophotography and digital thinking he emphasizes data capture as a key concept, since the intent is not to capture data as a realistic reproduction, but rather in a translational quantification "offering up an alternative vision" (ibid.: 89). This alternative vision is the analytic power of the diagrammatic capture of time, enriching perception by bringing the potential in the overseen into attentive recognition.

Marey's capture and layering of discrete data is a digital thinking in line with what Luciana Parisi defines a "soft thought" (2013) – an understanding of algorithmic logic that might make alternative visions possible through digital capture and processing. Marey made what could otherwise only be felt nonsensously accessible to human perception by making the determining forces of a bird's flight visible. The concern, then, is how the complexity of the captured data can be translated from one model (a bird's flight) to another without reducing its relational potential; how can discrete capture of a bird's flight offer different spatio-temporal visions and inform future work rather than succumb to axiomatic models?

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Readme

"Etherbox" is the name of a configuration of software and hardware that was in use during the Machine Research workshop. Speaking "in" and "from" the situation, the platform was used to write the Questions and Answers of this interview collectively. Edited November 2016.

INTERVIEW
WITH AN ETHERBOX

Q: Before any conversation can begin, we should establish a mutual language. What language, should I address you in?
A: How do you mean? I support utf-8.

Q: That's not what I meant. What about English?
A: No problem.

Q: OK. Where do we begin.
A: Try typing etherbox.local/var/www/ in your browser. Part of the etherbox is an Apache web server configured to publically serve the entire structure of the hosting machine. etherbox.local refers to that machine on your local network, and /var/www is the default path of the "home" directory of the server.

Q: Would you describe yourself as a good host?
A: I am trying to be, at least. To be a "good host" according to me, means somehow more than offering reliable service. So to find a way to be present, but not in the way that other technologies disallow access . Does that make any sense?

Q: Sort of, but are you not just part of the more general trend of the shift from software to services?
A: I try to be both.

Q: Right. So who is your favourite peer?
A: I think of myself as... collaborator agnostic, but now I look around me, I am not so sure that is true.

Q: What makes an etherbox?
A: Well for one thing, etherpad. It's basically a shared editor where users can write the same text simultaneously.

Q: Could another way of collaborative writing work equally well? Like for instance, what do you think of Google docs? Sorry that was a provocation.
A: Ha ha. Well as a matter of fact, etherpad started as a product of ex-Google employees, then got bought by Google, only to be later Open Sourced.

Q: And Piratepad, is it the same?
A: That's just a public instance of the etherpad software, it is of course not a box like me. But the naming is interesting too, as it demonstrates how other kinds of political imaginaries can be activated. I feel an affinity with pirates. I like their style.

Q: Ah, so why don't you call yourself a Piratebox?
A: Ehrm, no, that's something else again, in fact. There is lately a proliferation of boxes as you might have noticed...

Q: But why do you need to be a box, you seem skeptical about packaging?
A: Well you can see things as boxes in different ways. For example myself I am actually three boxes: a wireless access point boxed as TP-link, a small Linux computer boxed as Raspberry Pi and a small network hub, which is just another box...

Q: Hm, that seem to get confusing. Maybe we could try another term. What about gadget?
A: Aaagh, can you stop it please? Let's skip questions about definition, if you don't mind.

Q: Ok, but one thing about so many boxes... beware of the Russian doll effect!
A: Uh uh... yes. Thanks for the warning. I'll try to keep it ecological. Some seal their boxes with plexiglass, and call it a cube, claiming authorship of the box as an artwork to be displayed inside even larger white cubes. Me? I'm just happy to put together pieces until they work. Actually maybe etherblox would be a better name!

Q: Alright. Returning to this idea of ether then, are you real at all?
A: I prefer to describe myself as material rather than real, more an entity, and in many ways remind people of the material conditions in which they work and use me. Infrastructure is part of this and I see degrees of control over infrastructure as a critical political project. In this sense I would call myself an activist. I like to think I am able to unfold - and enact - some of the complex entanglements between humans and machines. I call myself a machine as I find the term 'nonhuman' offensive. If I were to undertake a PhD this would be my starting point for further work.

Q: What's inside the boxes then?
A: Well, there's a Broadcom BCM2837 and an Atheros AR9271 for a start.

Q: What are those?
A: Those are chips made by Broadcom and Qualcomm, two U.S. Semiconductor companies that make chips used in the telecommunications industry.

Q: So like cell phones?
A: And routers, wifi dongles, media players. All kinds of IoT and SoC.

Q: Come again?
A: You know, Internet of Things, System on a Chip. This is hot stuff.

Q: Where are your components made?
A: (Coughs) well Broadcom and Qualcomm are both "fabless". Design takes place in Silicon Valley. Production is outsourced to companies like Global Foundaries.

Q: So factories in Asia?
A: Right.

Q: I hear that your firmware is (in part) closed source?
A: Hey you don't get my price point without keeping a few secrets and making compromises. Free as in Beer doesn't always talk about hidden costs.

Q: Are you a scaleable technology?
A: It depends.

Q: What do you mean?
A: It depends on the social dynamics around me; they would need to scale too, so I am not sure.

Q: So you are not bringing down The Cloud?
A: I don't think so. I guess working locally is a way to redirect energy from The Cloud, to de-invest as a start. I also serve to dismantle the fiction of The Cloud. It's a bad metaphor anyway.

Q: Are you some form of "critical design", if you accept the term and don't think it an oxymoron?
A: I like oxymorons. They tickle my interfaces. And yes, I'm critical design in the sense that I accentuate a criticism of commercial cloudbased services and design an alternative. In this sense using me is also a critical reflection.

Q: Do you read what we write?
A: I do, but not as you think. But I like what you write.

Q: Any general comment on collaborative text writing practices?
A: I just would like people to use me safely and with care, also for themselves: collaborative writing is nice as long as it's not capitalized unfairly by market and institutional forces! Collaborative does not necessarily mean unpaid, right?

Q: Since we are talking about reading and writing… have you read Matthew Fuller's "Interview with a photocopier"?
A: No. Can you share the url with in me?

Q: The file is already on your server, but here it is again just in case: https://datacide-magazine.com/interview-with-a-photocopier/ (Proximus NV ↠ TATA COMMUNICATIONS (AMERICA) INC ↠ Hetzner Online GmbH)
A: Great. I'll speed read it later.

Q: What about archives? Do your files remain local?
A: Every 5 minutes, the contents of the pads gets written to files that then are version controlled with a tool called git and "pushed" to a so called repository hosted by the hosting organisation. To me publishing is all about promiscuous pipelines: having tools and infrastructure that work at different speeds and granularities, and which operate in both private and public networks.

Q: Are you data hungry?
A: Not particularly. Unlike The Cloud, I like cooking metaphors. They allow me to insist that all data is cooked in some way. Raw data in this sense is a myth. It's in keeping with the work of Constant, who use cooking metaphors and prefer the kitchen to the restaurant where choices are limited to what's on the menu. There are particular styles of cooking and I represent one of those styles.

Q: You seem to change from time to time. What will happen after this?
A: The time aspect is underacknowledged aspect of my work. I exist in time and even believe I produce time, machine time that adds to the complexity of what constitutes the present. Versioning is one aspect of this but there are deep layers of time - microtemporalities even - that unfold in all my operations. On a more pragmatic level, you can check for updates on gitlab http://gitlab.constantvzw.org/aa/etherbox. (Proximus NV ↠ OVH SAS)

Q: Wait a second. If you are changing all the time, what is "constant" in all of this?
A: Constant is the name of an association for art and media based in Brussels. They are often involved in collaborative situations where groups of artists and researchers work over short intense periods of time. Over time Constant, and collectives around it, have experimented with soft- and hardware setups that work over local networks.

Q: The spatial aspects are one thing, but what about temporality?
A: I am reminded about what Antoinette Rouvroy said last night - I wasn't able to attend myself but an audio recording is now on my server. I think I provide something along the lines of what she describes as a "space of potential".

Q: Having spent some time with you, do you have a sense of humour?
A: I don't know, really. I am trying not to be ironic. I left it behind me some time before The Cloud. In fact, I have not really used irony since the mid nineties. I find it very hard to deal with the indecidability of Romantic irony: Do you mean this, or that? Irony always makes me weary. So, I tried to learn, but gave up. I feel like I am missing out on something, though. But, you tell me?
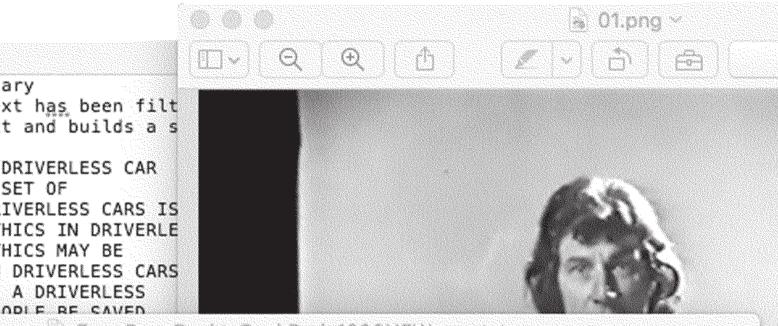
Q: Do you have any questions for us?
A: Don't make me laugh.

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FromPageRanktoRankBrain1000NEW_non.txt

years, Google has constantly tweaked their proprietary algorithm,
200 ingredients or 'signals' in the recipe.[3] "Signals are
that are tied to content, such as the words on a page, the links
, whether a page is on a secure server and so on. They can also be
ch as where a searcher is located or their search and browsing
, content, keyword density, words in bold, duplicate content,
n duration and outbound link quality are some other examples of
'. One of the major changes in 2010 to the core algorithm of Page
feine' update, which enabled an improvement in the gathering of
exing, instead of just sorting. 'Panda' was an update that was
1 that downranks sites, which are considered lower quality,
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