

Algorithmic Superstructuring: aesthetic regime of algorithmic governance

AUTHOR BIO

Alex Anikina (b. Kolomna, Russia) is a media artist, researcher, film-maker and curator, currently completing her PhD at Goldsmiths, University of London, and teaching at London South Bank University. Her dissertation investigates procedural films as research media art practice. Her work has been shown internationally, recently at Sanatorium gallery, Istanbul, Krasnoyarsk Museum Biennale and VI Moscow International Biennale for Young Art. She co-edited *Cosmic Shift: Russian Contemporary Art Writing* (ZED Books, London, 2017). In 2018 she co-curated IMPAKT media art festival (Utrecht, Netherlands) with the theme *Algorithmic Superstructures*.

Alex Anikina

ABSTRACT

In this paper I suggest the idea of algorithmic superstructuring as a way to explore aesthetic regimes of algorithmic governance, drawing on work of Jacques Rancière, Luciana Parisi and Wendy Chun. Algorithmic superstructuring presents as pervasive expansion of algorithmic processing and logic, installed under the techno-capitalist drive for quantifying, consolidating and regulating human experience. Algorithmic superstructuring is built into networks of distribution and circulation of affect and flourishes in the cognitive frameworks of interfaces and protocols. Building on previous curatorial work and drawing on media art practices, this paper aims to investigate how inhumanity of algorithmic modes and models of reasoning is reflected in the distribution of the sensible, and how the aesthetic regimes of algorithmic governance could be articulated.

KEYWORDS

algorithmic superstructuring, media art, algorithmic governance, distribution of the sensible

Media art has traditionally responded to questions of algorithmic governance by opening the ‘black box’ of technology, by revealing the power structures inside the machine, be it explicitly or implicitly, through hacking, commentary, speculative narratives, glitching and other methods. In the current moment it seems that such blackboxing takes on more menacing forms, as algorithms are made more and more opaque not only by proprietary claims, but also by narratives of technological mastery and progress. This is reflected in the investigations of algorithmic governance, or even ‘algocracy’ (Aneesh 2006, 2009; Danaher 2016), characterised by the unprecedented consolidation of access to big data and to proprietary algorithmic solutions in the hands of various state and corporate bodies. [1] Zeynep Tufekci (2015) identifies the main dangers of algorithmic governance as “lack of transparency, information asymmetry and hidden influence” (p.207). The shift to focus on the “algorithmic” from “software” has been also reflected in media studies. [2] “Drawing on contemporary media art practices and on studies of visual and algorithmic cultures, I would like to develop the idea of algorithmic superstructuring as a reading of aesthetic regimes of algorithmic governance. Through the work of Jacques Rancière and Luciana Parisi I will discuss how the inhumanity of algorithms can be regarded in relation to political aesthetics. First, I will outline how algorithmic superstructuring can be seen as distribution of the sensible and suggest the readings of inhumanity of algorithms within this setting. Secondly, I will draw on media art works in order to situate the processes of algorithmic superstructuring as localised in media art, labour, in blackboxing and imaginaries of technology. Finally, I will consider how interfaces and ‘persistence of vision’ affect algorithmic superstructuring as a larger condition and as an aesthetic regime of algorithmic governance.

[1] See Danaher et al. (2017) for comprehensive outlines of the stakes and challenges of algorithmic governance.

[2] In the last two decades, theories of media have adapted to the emergence and proliferation of algorithmic processing. Some of the pivotal discussions in this sense are represented by software and new media analysis by Lev Manovich (2001), and the critical studies of software by Matthew Fuller (2003) and Alexander Galloway (Essays 2006). Due to the challenges that have been brought on by advanced data processing techniques such as machine learning, data mining and predictive analysis, the algorithmic itself, seen as a concatenation of design, economic, cultural and political concerns, has become the focus. The term “algorithmic culture” was offered by Galloway (Essays 2006); further mapping of the term can be found in Gillespie (2014) and Striphos (2015).

The curatorial concept, *Algorithmic Superstructures*, was developed as a theme for IMPAKT media art festival by Yasemin Keskinetepe, Luba Elliott and I. It took place in Utrecht, Netherlands, in October 2018. *Algorithmic Superstructures* in its initial iteration was aimed at investigating widely, through artistic, theoretical and design approaches, the epistemic and affective shifts brought on by algorithmic processing. The idea of algorithmic superstructures appeared as an attempt to describe the ways in which the traditional systems of politics, media, labour and art are being overlaid and displaced by new algorithmic frameworks, interfaces and protocols, installed under the techno-capitalist drive for quantifying, consolidating and regulating human experience. Referring specifically to these processes of displacement, we imagined algorithmic superstructures as pervasive, expansive, open vectors of algorithmic processing and logic that flourish under the auspices of the attention economy, where codes, images, software and protocols serve as primary mediators in the networks of the commercialisation, capture and circulation of affect. The spaces of knowledge and affect production that are created within algorithmic culture were the primary focus of our festival concept. In the course of the festival and its many public discussions and conversations with artists, it seemed that there was a particular ambiguity where artistic fascination with the inhuman nature of algorithmic reasoning intermingled with the inhumanity of rationality clearly seen in the proprietary structures of algorithmic governance. These two kinds of inhumanity – the

“alien” and the “proprietary” one – seemed to be at times confused, equated, or intentionally interchanged.

In this paper I aim to articulate the idea of algorithmic *superstructuring* (now used as a verb) in order to see more clearly how these two kinds of inhumanity are actualised as political aesthetics of algorithmic governance. The *superstructuring* in algorithmic superstructuring takes on a different meaning from its original Marxist debate of base and superstructure. In the transition, as Raymond Williams puts it, “from Marx to Marxism,” the economic base has been often interpreted as determining the political and legal (later also ideological and cultural) superstructure (“Base and Superstructure”). The strict economically reductionist approach was already criticised by Engels in a letter to Joseph Bloch in 1890 (Marx and Engels 498), and many theorists argued for a more nuanced reading of the interrelation of base and superstructure. Williams in his insightful analysis suggests that instead of a rigid, static understanding of base and superstructure, there needs to be a “more active idea of a field of mutually if also unevenly determining forces” (*Problems in Materialism and Culture* 36-37). Alex Callinicos suggests that the forces and relations of production merely set limits to the “superstructure” rather than determine it (97). Similarly, the use of superstructuring in this paper is not aimed at representing algorithms as a rigid hegemonic superstructure, but rather at investigating them as processes, and at discovering their potential affective and cognitive agency within governing structures, as well as the aesthetic configurations that result from it.

Theorists of digital culture have often had recourse to Rancière’s formulation of the distribution of the sensible to describe the regulatory function of computational processes in the acts of concealing and revealing (Steyerl “Proxy Politics”; Dieter 222). In this sense algorithms, software, protocols and interfaces can be seen as politico-aesthetic regulators, in Rancière’s sense of such phenomena serving the function of “delimitation of spaces and times, of the visible and the invisible, of speech and noise, that simultaneously determines the place and the stakes of politics as a form of experience” (Rancière 8). Where the distribution of the sensible “reveals who can have a share in what is common to the community based on what they do and on the time and space in which this activity is performed” (8), algorithmic superstructuring also establishes modes of being, sensing and acting.

In Rancière’s account, the scope of the “aesthetic” is not confined to questions such as the status of the art object, but rather pertains to the general field of life and its sensible forms and practices. Seen in this light, aesthetics in algorithmic capitalism refers to the cognitive production and movement of affect. As Michael Dieter notes, “The alteration of sense and perception in CTP [critical technical practice] speaks to the classic meaning of *aisthesis*, but now explicitly defined by sociotechnical events” (220), where *aisthesis* is meant as perception through the senses. In this sense Rancière’s argument for the distribution of the sensible directly aligns with the vectoral character of algorithmic superstructuring. Algorithms produce meaningful and affective aspects of life, and more often than not this occurs along the vectors of algorithmic governance. As algorithmic infrastructures underlie the conditions for working, learning, consuming and creating, the algorithmic *superstructuring*

re-distributes the sensible aspects through its interfaces, analytical modes and choices. If one applies Rancière's call for aesthetics to serve "the invention of the sensible forms of the life to come" (24), the ethical task of the media artist seems to be located precisely in uncovering and re-inventing forms of experience produced by technical media.

The key capacity of algorithmic superstructuring to circumvent modern modes of organisation and install its own logic can be seen as an ability to affect the very conditions of knowledge production. Where the value chain and information distribution are controlled, the communication space is also reorganised accordingly. Tarleton Gillespie argues that the algorithm has become "a key logic governing the flows of information" (167). Algorithmic superstructuring, crucially, has to be seen not as a solely materialist reorganisation of economical structures, but also of meaning itself. While interfaces participate in the distribution of the sensible in the most direct way, by offering and limiting choices of action of the user, it is the invisible algorithmic processes and power formations that affect the conditions of meaning-making. It is in this sense that Ganaele Langlois argues for the shift towards understanding meaning not only as a human process, but as "one that is increasingly dependent on media technologies" (5). In her investigation of social media algorithms, she finds that software contributes to meaning-making as "a semiototechnology in charge of producing both meaning and the conditions for the experience of meaningfulness" (19).

So how do we address the distribution of the sensible, if the distribution process involves an active algorithmic renegotiation of pre-cognitive aspects of 'sensible'? By pre-cognitive aspects I mean those that occur either outside the scale of human cognition and senses (such as high-frequency trading), or passing below the threshold of user's media literacy (such as interface elements). I would like to suggest superstructuring as the process of techno-cultural construction of meaning which, importantly, acknowledges the agency of the technical components that modulate and direct cognitive processes. That does not mean assigning human-like agency to algorithms, but, rather, considering their part in the decision-making processes. Parisi suggests, in the essay "Reprogramming Decisionism," that with the incursion of algorithmic automation into decision-making processes, it becomes possible to speak of a kind of "technological decisionism, which values making a clear decision quickly more than it does making the correct one" (para 2). She posits algorithmic processing, following N. Katherine Hayles, as a "nonconscious form of cognition, solving complex problems without using formal languages or deductive inference" ("Reprogramming Decisionism", para 13), as well as working at scales and speeds inaccessible to human perception. Where Hayles suggests the "the exteriorization of cognitive abilities" (11) to technical systems, this suggestion seems to echo one of the definitions that Williams suggests for superstructures – that of the "forms of consciousness" arising from the conflict introduced by real relations of production (*Marxism and Literature* 76).

In other words, the transformation of the computational paradigm from the rationalist top-down causality to correlation in advanced algorithms also means an epistemological shift towards what Parisi calls "soft thought" (*Contagious*

Architecture) and, later, “inhuman thinking” (“Reprogramming Decisionism”). To take one of the popular examples, in neural networks, the direct causal links between the algorithm and the datasets are foregone in favour of more efficient meta-analysis that creates its own algorithmic relations as it analyses datasets, and bases the ensuing analysis on those algorithmic relations. For Parisi, this new paradigm represents a radical departure from the rationalist theories of computation precisely because it is inseparable from indeterminacy, noise and unknown data: machine learning “is indifferent to the entropic noise of increasing data volumes insofar as this noise is precisely part of the learning process” (“Reprogramming Decisionism”). “Inhumanity” in this case can be attributed to the technical impossibility of tracing the entirety of micro-decisions that went into building a specific model. However, it should also be considered from the point of virtual opacity of such models as they enter the areas of decision-making, often staying within the proprietary copyright of their owners. While there has been a noticeable increase in recent initiatives for ethical guidelines and legislation surrounding the use of datasets, [3] in the current moment such models are freely built into the processes of analysing experience and channelling affect.

[3] For example, the Institute for Ethical AI & Machine Learning in UK (opened in 2018), the Ethics and Governance of Artificial Intelligence Initiative launched by MIT Media Lab and the Harvard Berkman-Klein Center in 2018, and the European AI Alliance (2019). This is not to exclude earlier work accomplished in this direction, or a wide range of open systems that are community-run (such as Women in AI or Platform Cooperativism Consortium), but to underline a recent surge in the wider acknowledgement of necessity for ethical regulation of algorithmic processing.

The participation of “proprietary” inhumanity in the algorithmic distribution of the sensible can be clearly seen in how it is organised around the axis of the commodification of experience. The process of data commodification runs parallel to the commodification of affect and the design of user experience. Following the vector of algorithmic superstructuring from the initial economic motivation to the design and implementation of algorithms, it becomes possible to see how the design of user experience perpetuates the automation of various cultural operations through software abstraction. This can be seen in platforms such as Netflix, as well as other services using recommendation algorithms. In this sense, the dangerous aspect of algorithmic superstructuring lies not only in its pervasiveness, but in the loop of commodification of experience and affect that it enables. Where data collection participates in infinitely updating feedback loops, it guarantees continuous commodification: as data analysis turns human choices, experience and attention into rationalised models, these models, in their turn, create more and more refined and precise definitions of what kind of experience is marketable. As Brian Massumi notes, “the ability of affect to produce an economic effect more swiftly and surely than economics itself means that affect is a real condition, an intrinsic variable of the late capitalist system, as infrastructural as a factory” (45). The affective capacities of algorithmic procedures are therefore embedded in the software regime of abstractions.

But while it is generally possible to trace the “proprietary” inhumanity of algorithms to the economic motivation of the platform, does it account for the entirety of experience and affective space that it creates for the user? In “The Incomputable and Instrumental Possibility,” Antonia Majaca and Parisi draw on Judith Butler’s writing to suggest a possibility of feminist re-claiming of machinic instrumentality. They suggest that machine logic, primarily seen as a part of a “paranoid techno-industrial apparatus” relying on collecting and flattening data as predictive models, could be also reclaimed on its own terms, as an alien logic that embraces its own instrumentality and repurposes it for its own ends, potentially disrupting the white-male concept of humanness as a

whole. While this suggestion is speculative in nature, it offers a way to acknowledge that the “proprietary” inhumanity of algorithmic superstructuring does not exclude the possibilities for other kinds of inhumanity, built in different ways and experienced in different ways. The inhuman scales of technical infrastructures introduce affective and cognitive renegotiation of human experience. Algorithmic superstructuring, understood as distribution of the sensible, can be then seen as a scalable dynamic that negotiates the infrastructural design of algorithms as an aesthetic regime that conditions the production of meaning. Considering the local aesthetic configuration, where machine logic is normally hidden behind the persistent sprawl of well-interfaced business solutions, the process of “un-blackboxing” should include a similarly persistent inquiry into the processes of design and labour.

In order to look at algorithmic superstructuring through the inquiry of artistic practice, I will draw on several projects from the festival, selected for exhibition by Yasemin Keskinetepe. These projects, in particular, engaged with the question of the correlational rather than causal links introduced by the machine learning technologies, investigating how these technologies participate in meaning-making in embedded cultural contexts. The work of Constant Dullaart, *The European Classes*, *Euronet* (2017), developed in collaboration with Adam Harvey, uses convolutional neural networks that recognise objects within images in order to create an image dataset. The artists retrained the networks on “European artefacts” in order to investigate how European cultural output can be presented in a dataset, and how the network can classify something as European. [4] The 152 classes for image recognition ranged from common – “guitar,” “beret” – to more specific: “Hagelslag,” “Chancellor Angela Merkel.” The neural networks, essentially tasked with the question of European identity, are solving the technical question of semantic segmentation – what parts of the images are recognised as a particular descriptor, and what images can be reconstructed from these correlational links. Highlighting how algorithmic automation can enter the areas that have been considered a cultural domain, this work also reconstructs the capacity of machine learning to produce meaning, referring to the cases in which machine learning techniques, when applied to existing datasets, produced sample bias, in that they uncovered pre-existing bias in the set itself.

[4] See description and documentation on the work’s website, ImageNet.xyz.

Anna Ridler’s video *Mosaic Virus* (2018) was developed during the EMAP residency at the festival. It draws a parallel between “Tulip Mania,” the economic bubble that witnessed an extraordinary inflation of prices for tulip bulbs in the Netherlands and Europe in the 1630s, and the current moment of crypto-currencies. The video continuously generates, through a neural network, an image of a tulip, mimicking the prototypical Dutch still life. The number of stripes on the tulip, which in the seventeenth century would have signified its value, is in Ridler’s work linked to the fluctuation of the value of bitcoin. One could suggest that *Mosaic Virus* does not so much provide commentary on crypto-currencies as ironically re-position media art within the discussion of value formation of the more traditional forms of art.

Both of these works can be interpreted in the tradition of “blackboxing” as revealing of the algorithmic thinking behind the machine and “highlighting”

its inhumanity. They also, however, have the capacity to underline processes of labour and alienation hidden behind machine learning. While the common perception of neural networks is still largely perceived as “computers doing all the work,” there is a significant amount of human labour involved in the annotation of images. In the case of Ridler it was made especially visible since the ten thousand photographs in the dataset were taken by the artist herself, categorised manually and exhibited as additional work, *Myriad (Tulips)*. In Dullaart’s work, some of the classes could be defined using semi-automatic image scrapers, and for some of the classes the bounding boxes that define objects had to be manually drawn, using outsourced and in-house labour. The question of making this labour visible becomes an artistic choice alongside others.

Artist Sebastian Schmieg, whose work *Segmentation.Network* (2016–2018) highlights exactly this kind of manual labour, speaks of “humans as software extensions” (“Humans”) in his discussion of the outsourcing platforms such as Fiverr or Amazon’s Mechanical Turk. In the quick-gig economy it is still possible to see how “bodies and minds that are algorithmically managed [are] under the permanent pressure of constant availability, efficiency and perpetual self-optimization.” However, as Schmieg points out, citing a 2015 court case in which Gabriela Rojas-Lozano sued Google for alleged exploitation of users by micro-tasking them with Google reCAPTCHA, the labour can be fragmented to the point where its very definition as labour becomes contestable (“Humans”). In the work of Anna Ridler, where the labour process is shown as an artwork in its own right, the alienation of labour that machine learning facilitates runs parallel to alienation of the subject, seemingly excluded from the imaginary financial loop that the tulips constitute. Media artworks that seem to operate on their own, not needing any human input beyond the initial set-up, create a perception of agency by default. Here, chance and autonomous operation emerge as a more familiar reading of independency of algorithms. The potential for accidents is created and determined at the moment of the invention of a particular technology, as Virilio reminds us (*The Original Accident*). But as accidents, according to glitch artist Rosa Menkman, can create “a new protocol after shattering an earlier one” (“Glitch”), they inevitably return even such limited agency back to the realm of instrumentality.

While liberatory “inhuman thinking” remains, in most cases, a speculative dream, proprietary inhumanity has its own dreams of transcending instrumentality. Anthropomorphic algorithmic agents such as chatbots and virtual assistants are, essentially, blackboxes hidden even further, behind figuration. Visibility allows them to operate as entities separate from their creators and at the same time to act as a lightning rod for potential reputation damages. A good example of this is Tay, a Microsoft bot for Twitter that became known as “racist chatbot” (Schwartz). The naming itself illustrates how easily the responsibility for the inhumanity of a biased algorithm can fall on the algorithm itself. In this sense, the artistic approaches to destroying the opacity of algorithmic superstructuring need to navigate both the economic relations and technical conditions behind automated processes and how instrumentality translates into images and mythologies. Datasets represent a particularly interesting entanglement of these elements. On the one hand, if “poor” image, in Hito Steyerl’s insightful suggestion, becomes about “its own

real conditions of existence” (“In Defense”), the images used for datasets in machine learning seem to be the poorest of all. The still and moving images on the Internet, while alienated from their origins as soon as they are posted, shared and anonymised online, still contain the traces of the original labour that went into their production. Their outwards visibility means the invisibility of that labour. On the other hand, the images that are contained in the datasets needed to train the neural networks lead to the creation of “image-models” (Parisi “Xeno-Patterning”). And “poor” images become “rich” in other ways, when impossible sofas, non-existing people and paintings generated by neural networks are put in the context of art market and auctions. [5]

[5] As evidenced by some of the auction sales of the portraits and landscapes generated by generative adversarial networks. See Vincent “A Never-Ending Stream of AI Art Goes up for Auction”.

Negotiation of visibility signals the need for a technical media literacy, and where it concerns critical artistic approaches, such literacy seems to be already built in. *The Critical Engineering Manifesto* by Julian Oliver, Gordan Savičić and Danja Vasiliev articulates the triangulation between the technical function of the work, the user experience (as potentially obscuring the entirety of the function), and its critical perception by the engineer. The Critical Engineer “considers any technology depended upon to be both a challenge and a threat,” and also “recognises that each work of engineering engineers its user, proportional to that user's dependency upon it”; at the same time, the Critical Engineer “raises awareness that with each technological advance our technological literacy is challenged”, and “deconstructs and incites suspicion of rich user experiences” (Oliver et al.). Algorithmic superstructuring in this regard remains a process in which such suspicions are possible. However, if media literacy is not built in, addressing the complex space where algorithmic agents insert new kinds of agency and modes of non-conscious cognition requires particular attention to what role various visuals, mythologies, fictions and imaginaries play in the construction of technology. For example, James Bridle’s *New Aesthetic*, which comprises a diverse collection of images, blog posts, lectures and artworks, addresses various kinds of images that arise from the incursion of the digital into the span of human perception – from 3D models and glitched Google Maps to documentation of machine vision techniques. [6] This view incurred critique for its umbrella-like character and the conflation of many different technologies and contexts under what seemed like an obsession with surface-level aesthetics (Sterling). Bridle’s response of keeping the *New Aesthetic* as a diverse collection of items, as “an attempt to ‘write’ critically about the network in the vernacular of the network itself: in a tumblr, in blog posts, in YouTube videos of lectures” (“The New Aesthetic”), only highlights the problem of separating the audience into those who possess technical literacy and those who do not.

[6] See Tumblr page, *The New Aesthetic*, <https://new-aesthetic.tumblr.com/>.

Where the critical spectator is not a given, algorithmic superstructuring relies on vision as perpetuating engine. The aesthetic regime of algorithmic governance and its participation in the distribution of the sensible is actualised by the interfaces. With their help, the inhumanity of algorithmic superstructuring can instantly scale down back towards instrumentality in order to become invisible – or, more precisely, to hide behind the visibility of the interface. It is also the “persistence of visual knowledge” that Wendy Chun analyses to suggest that software can be seen as analogous to ideology (“Control and Freedom” 19; “On Software”). As she puts it, “software and ideology fit each other perfectly because both try to map the material effects

of the immaterial and to posit the immaterial through visible cues” (“On Software” 44). She remarks on the formal similarity between software and various definitions of ideology, from the “false consciousness” such as that represented in the film *Matrix*, to the Althusserian idea of ideology as a *representation* of the lived social relation. Chun also highlights the fetishistic logic of the graphic interface: “users know very well that their folders and desktops are not really folders and desktops, but they treat them as if they were – by referring to them as folders and as desktops” (43). As there is a process of making visible, “through this process the immaterial emerges as a commodity, as something in its own right” (44). Chun points out that precisely because of the dual relation of concealing and revealing, software cannot be seen as completely analogous to ideology. As software reveals as much as it conceals, given a critical eye, it acts both as ideology and critique of ideology. The interplay of figurative and operational images makes software “algorithmically affective in ways that ideology never was” (Galloway, “Language” 325). Alexander Galloway similarly highlights the central paradox of the ideological reading of software as “technical transcoding without figuration that nevertheless coexists with an exceedingly high level of ideological fetishism and misrecognition” (Galloway, “Language” 319).

Scaling between the human and the algorithmic, deciding what stays visible and what does not lies at the heart of algorithmic superstructuring and its redistribution of the sensible. Infrastructural affect consolidates at the visible level of interfaces as various kinds of images – not only representational, but images of symbolic navigation or other interface elements that simultaneously *make possible* and *limit* the user’s interaction, that guide, prompt, attract and distract. Algorithmic superstructuring presupposes that different kinds of images co-exist, both as figurations subject to commodity fetishism and as participants in software and algorithmic abstractions. At the interface level, the vectors of axiomatisation are always actualised both as data structures, and as aesthetic operations interweaved with code. As Benjamin Bratton underlines in his theorisation of algorithmic governance as *The Stack*, the platforms evolve in relation to their aesthetic formalisation:

Platforms are infrastructural but rely heavily on aesthetic expression and calibration. [...] Even as the majority of the information they mediate may be machine-to-machine communication (as, for example, today’s Internet), the specific evolution of any one platform, in the ecological niche between the human and inhuman, depends on how it frames the world for those who use it. (46)

The key focus of the aesthetic regime of algorithmic superstructuring therefore lies in the interpenetration of algorithmic abstractions and aesthetic codes used to represent these relations to the human.

Capturing and understanding instrumentality in order to open the technological black box remains a difficult task when one is confronted with persistence of vision. Algorithmic superstructuring is characterised by its universality, by its ability to cut across contexts; it is stimulated towards constant expansion by capitalist logic, has to rely on ever-changing data and is unable to stabilise. Locating and addressing the specific spaces where the

entanglement of design, labour and aesthetic is visible, and where it becomes possible to reclaim the instrumentality for other ends, is the task that in the field of media practices has often been delegated to artists, hackers, activists and engineers. In this regard, a model of planetary computation such as Bratton's *The Stack* that envisages the algorithmic abstractions as a "design brief" of computational sovereignty, can be productive for artistic approaches in that it identifies the layers where such operations become more defined. In other words, the very naming of layers can become part of possibility of the reversal of the vectors of sovereignty. While *The Stack* is an accidental megastructure meant to reflect the all-encompassing state of planetary computation, algorithmic superstructuring addresses the localised, situated encounters. Where algorithmically mediated processes of distribution of the sensible take place, they also produce an aesthetic renegotiation of agency, alienness and humanness. In this regard the universal, vectoral, oppressive orientation of algorithmic superstructuring is always already localised, but is also a part of scalable architecture that connects the human experience to larger technological structures.

[7] While the current paper focuses on the aesthetic regimes, it seems that a further discussion of transnational and extralegal character of algorithmic superstructuring would require an inquiry into the growing discussion on digital colonialism. The scholarly roots can be traced to Marshall McLuhan's work and Tom McPhail's concept of electronic colonialism (1987), as well as to the work of Michael Hardt and Antonio Negri (2000). The term itself, however, was brought into public discussion in 2015 by the artist Morehshin Allahyari as one of the outcomes of her research for *Material Speculation: ISIS* (Allahyari 2015, 2019). The project consisted of 3D-printed replicas of a set of twelve artefacts, destroyed in 2015 by ISIS, from the ancient cities of Hatra and Nineveh. The term was adopted by discussions of digital forms of traditional colonialism (Jandrić and Kuzmanić; Kwet). Most recently, however, it has been used in a wider sense, to signify a new form of data colonialism unique to the current trans-nationalist capitalism – both by media outlets (LaFrance; Solon; Pilling) and in scholarly work (Couldry and Mejias; Ricaurte).

Conclusion

Along with the algorithmic superstructuring entering individuals' lives, the representations and abstractions that lie at the core of software operations enter their very bodies and become internalised as modes of perception and habits, furthering the opacity of the processes that actually take place (e.g. data collection). This becomes particularly important when we consider the transnational and extra-legal character of capitalist relations, and the globalised cultural and aesthetic regimes that automate logic of consumption. [7] While a recent development such as EU General Data Protection Regulation (GDPR) implements the "right to explanation" of the algorithmic blackbox, it does not legally compel the companies to disclose the technical details fully (see Rudin; Casey, Farhangi and Vogl). Even more important is the capacity of algorithmic superstructuring to set new protocols and logics, altering the *conditions* of knowledge production. Algorithmic superstructuring operates in a grey zone in terms of both distribution of power relations and human experience. The focus of algorithmic superstructuring thus lies in the aesthetic and epistemic effects, concentrating both on the ways in which algorithmic media can create affective spaces and alternative temporalities, and on the ways in which the logic of design built in the platforms, software and algorithms aids the pervasive processes of commodification and capture of attention, affect and experience.

As a postscript, I would like to add a final consideration. This article started in a very different situation from the one in which I am completing revisions. The algorithmic mobilisation and the heightened use of platforms brought on by the pandemic of Covid-19 seem to throw the processes of algorithmic superstructuring into stark relief. While workers all over the world are losing jobs, Amazon warehouses in the USA are attracting new hires with \$2 raise on the hourly rate. As social and cultural activity is frantically moved online, more and more faces become part of the vast pool of potential image datasets. The grassroots cooperation becomes more visible, but so do the surveillance

measures: the regimes of identification, previously hidden in plain sight, are openly used for the sake of identifying the spread of infection. For media studies, the pandemic might also signify a challenge of pervasive algorithmic superstructuring on a global scale.

Works Cited

- Allahyari, Morehshin. "Material Speculation: ISIS." CyArk 500, Washington DC, 2015 <https://www.youtube.com/watch?v=ntXYKcbbwPw>.
- . "Physical Tactics for Digital Colonialism." *Medium*, 7 June 2019. https://medium.com/@morehshin_87856/physical-tactics-for-digital-colonialism-45e8d3fcb2da.
- Aneesh, A. *Virtual Migration: The Programming of Globalization*. Durham, NC: Duke University Press, 2006.
- . "Global Labor: Algocratic Modes of Organization." *Sociological Theory* 27.4 (2009): 347–370.
- Bratton, Benjamin H. *The Stack: On Software and Sovereignty*. Cambridge, MA: MIT Press, 2016.
- Bridle, James. "The New Aesthetic and Its Politics." *Booktwo.org*, 12 June 2013. <http://booktwo.org/notebook/new-aesthetic-politics/>.
- Callinicos, Alex. *The Revolutionary Ideas of Karl Marx*. London and Sydney: Bookmarks Publications, 1983.
- Casey, Brian, Ashkan Farhangi and Roland Vogl. "Rethinking Explainable Machines: The GDPR's Right to Explanation Debate and the Rise of Algorithmic Audits in Enterprise." *Berkeley Technology Law Journal* 34.1 (2019): 145-189.
- Christie's. "Is Artificial Intelligence Set to Become Art's next Medium?" 12 December 2018. <https://www.christies.com/features/A-collaboration-between-two-artists-one-human-one-a-machine-9332-1.aspx>.
- Chun, Wendy Hui Kyong. *Control and Freedom: Power and Paranoia in the Age of Fiber Optics*. Cambridge, MA: MIT Press, 2005.
- . "On Software, or the Persistence of Visual Knowledge". *Grey Room* 18, January (2005): 26–51.
- Couldry, Nick, and Ulises A. Mejias. "Data Colonialism: Rethinking Big Data's Relation to the Contemporary Subject." *Television & New Media* 20.4 (2019): 336–349.

Danaher, John. "The Threat of Algocracy: Reality, Resistance and Accommodation." *Philosophy & Technology* 29. 3 (2016): 245–268.

Danaher, John et al. "Algorithmic Governance: Developing a Research Agenda through the Power of Collective Intelligence." *Big Data & Society* 2 (2017). <https://journals.sagepub.com/doi/10.1177/2053951717726554>.

Dieter, Michael. "The Virtues of Critical Technical Practice." *Differences* 25.1 (2014): 216–230.

Dullaart, Constant, and Harvey, Adam. "ImageNet.xyz by Constant Dullaart." *ImageNet.xyz*, 2017. <http://imagenet.xyz/>.

Fuller, Matthew. *Behind the Blip: Essays on the Culture of Software*. New York: Autonomedia, 2003.

Galloway, Alexander R. *Gaming: Essays on Algorithmic Culture*, Vol. 18. Minneapolis, MN: University of Minnesota Press, 2006.

---. "Language Wants to Be Overlooked: On Software and Ideology." *Journal of Visual Culture* 5.3 (2006): 315–331.

Gillespie, Tarleton. "The Relevance of Algorithms." *Media Technologies: Essays on Communication, Materiality, and Society*, ed. Tarleton Gillespie, Pablo J. Boczkowski and Kirsten A. Foot. Cambridge, MA: MIT Press, 2014, 167–193.

Hardt, Michael, and Antonio Negri. *Empire*. Cambridge, MA: Harvard University Press, 2000.

Hayles, N. Katherine. *Unthought: The Power of the Cognitive Nonconscious*. Chicago: The University of Chicago Press, 2017.

Jandrić, Petar and Ana Kuzmanić. "The Wretched of the Network Society: Techno-Education and Colonisation of the Digital." *Out of the Ruins: The Emergence of Radical Informal Learning Spaces*, ed. Robert H. Haworth and John M. Elmore. Oakland: PM Press, 2017, chapter 5.

Kwet, Michael. "Digital Colonialism: US Empire and the New Imperialism in the Global South." *Race & Class* 60.4 (2019): 3–26.

LaFrance, Adrienne. "Facebook and the New Colonialism." *The Atlantic*, Feb. 2016. <https://www.theatlantic.com/technology/archive/2016/02/facebook-and-the-new-colonialism/462393/>.

Langlois, Ganaele. *Meaning in the Age of Social Media*. London: Palgrave Macmillan, 2014.

Majaca, Antonia and Luciana Parisi. "The Incomputable and Instrumental Possibility." *E-Flux* 77, Nov. (2016). <https://www.e->

flux.com/journal/77/76322/the-incomputable-and-instrumental-possibility/.

Manovich, Lev. *The Language of New Media*. Cambridge, MA: MIT Press, 2001.

Marx, Karl, and Frederick Engels. *Selected Correspondence*. Moscow: Foreign Languages Publishing House, 1956.

Massumi, Brian. *Parables for the Virtual: Movement, Affect, Sensation*. Durham, NC: Duke University Press, 2002.

McPhail, Thomas L. *Electronic Colonialism: The Future of International Broadcasting and Communication*. Newbury Park, CA: Sage Publications, 1987.

Menkman, Rosa. "Glitch Studies Manifesto." *Video Vortex Reader II: Moving Images beyond YouTube*, ed. Geert Lovink and Rachel Somers Miles. Amsterdam: Institute of Network Cultures, 2011, 336–347.

Oliver, Julian, Gordan Savičić and Danja Vasiliev "The Critical Engineering Manifesto." *Critical Engineering*, 2011. <https://criticalengineering.org/>.

Parisi, Luciana. *Contagious Architecture: Computation, Aesthetics, and Space*. Cambridge, MA: MIT Press, 2013.

---. "Reprogramming Decisionism". *E-Flux* 85 Oct. (2017). <https://www.e-flux.com/journal/85/155472/reprogramming-decisionism/>.

---. "Xeno-Patterning: Predictive Intuition and Automated Imagination." *Angelaki* 24.1, (2019): 81–97.

Pilling, David. "Are Tech Companies Africa's New Colonialists?" *Financial Times*, 5 July 2019.

Rancière, Jacques. *The Politics of Aesthetics*. London: Bloomsbury Academic, 2018 [2003].

Ricaurte, Paola. "Data Epistemologies, the Coloniality of Power, and Resistance." *Television & New Media* 20.4 (2019): 350–365.

Rudin, Cynthia. "Stop explaining black box machine learning models for high stakes decisions and use interpretable models instead." *Nature Machine Intelligence* 1 (2019): 206–215.

Schmiege, Sebastian. "Humans as Software Extensions." *Sebastian Schmiege*, 31 January 2018. <http://sebastianschmiege.com/text/humans-as-software-extensions>.

Schwartz, Oscar. "In 2016, Microsoft's Racist Chatbot Revealed the Dangers of Online Conversation." Institute of Electrical and Electronics Engineers (IEEE), 25 November 2019. <https://spectrum.ieee.org/tech-talk/artificial->

intelligence/machine-learning/in-2016-microsofts-racist-chatbot-revealed-the-dangers-of-online-conversation.

Solon, Olivia. “‘It’s Digital Colonialism’: How Facebook’s Free Internet Service Has Failed Its Users.” *The Guardian*, 27 July 2017.
<http://www.theguardian.com/technology/2017/jul/27/facebook-free-basics-developing-markets>.

Sterling, Bruce. “An Essay on the New Aesthetic.” *Wired*, April 2012.
<https://www.wired.com/2012/04/an-essay-on-the-new-aesthetic>.

Steyerl, Hito. “In Defense of the Poor Image.” *E-Flux* 10 November (2009).
<https://www.e-flux.com/journal/10/61362/in-defense-of-the-poor-image>.

---. “Proxy Politics: Signal and Noise.” *E-Flux* 60 December (2014).
<https://www.e-flux.com/journal/60/61045/proxy-politics-signal-and-noise/>.

Striphas, Ted. “Algorithmic Culture.” *European Journal of Cultural Studies* 18.4-5 (2015): 395–412.

Tufekci, Zeynep. “Algorithmic Harms beyond Facebook and Google: Emergent Challenges of Computational Agency.” *Journal on Telecommunications and High Technology Law* 13 (2015): 203.

Vincent, James. “A Never-Ending Stream of AI Art Goes up for Auction.” *The Verge*, 5 March 2019.
<https://www.theverge.com/2019/3/5/18251267/ai-art-gans-mario-klingemann-auction-sothebys-technology>.

Virilio, Paul. *The Original Accident*. Cambridge: Polity Press, 2007.

Williams, Raymond. “Base and Superstructure in Marxist Cultural Theory.” *New Left Review*, I/82, November-December 1973.

---. *Marxism and Literature*. Oxford University Press, 1977.

---. *Problems in Materialism and Culture: Selected Essays*. London: Verso Editions and NLB, 1980.