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Knowledge Production and Social Relations in the Age of Governance by Data Infrastructure

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11. **Commentary: Taking to Machines: Knowledge Production and Social Relations in the Age of Governance *by* Data Infrastructure**

Stefania Milan

Abstract

Algorithmic regimes are firmly installed at the core social organization, affecting the way we interact with the world around us. This exercise of “taking to machines,” however, raises three critical questions: the opacity of the infrastructure, the potential social costs, and the generative qualities of algorithmic systems able to reshape politics and the polity. These developments are the manifestation of a (relatively new) form of governance—“governance *by* data infrastructure”—capable of moulding social interactions in ways that jeopardize citizen agency. From the vantage point of critical data studies, this commentary describes the main features of governance *by* data infrastructure, exposing what kinds of knowledge are produced by these practices and what publics are evoked—and why we should worry.

Keywords: algorithmic regimes; citizen agency; critical data studies

Introduction

Between 2014 and 2020, the Dutch government deployed an algorithmic system known as SyRI (System Risk Indication) to assess the propensity to fraud or abuse in recipients of child welfare support. SyRI drew sensitive data from 17 databases to assign a “risk score” to the beneficiaries of some form of public assistance. The algorithm, however, unlawfully flagged citizens with a foreign surname, dual citizenship, or residence in low-income districts

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(Bekker, 2021). Those subjected to this algorithmic regime were unaware of being classified. “SyRI is part of a global trend of introducing digital tools in welfare states without taking into account the potentially devastating consequences they may have on a range of internationally protected human rights,” warned Philip Alston, United Nations Special Rapporteur on extreme poverty and human rights. “This system can have a hugely negative impact on the rights of poor individuals without according them due process” (UN Office of the High Commissioner, 2019).

The Dutch “risk indicator system” is just one of the many recent examples of how publics and social interactions are evoked and managed through the algorithms. Today, algorithmic regimes are firmly installed at the core of social organization. They mediate anything from shopping to job market selection, from political participation to welfare state service delivery. They have the ability to make and unmake (digital) publics, as demonstrated by Poehhacker, Burkhardt, and Passoth in their analysis of recommender systems. They have social-epistemological effects, as exposed by the examination of the algorithmic structuring of the news environment proposed by Wiengarn and Arnold. They contribute to the ordering of the urban space as Boeva and Kropp describe in their inquiry into the expansion of computational design in the construction and architecture sector. And they do not exist in a vacuum, as Büchner, Dossall, and Constantiou show in their evaluation of organizational processes in the case of predictive policing in Germany.

This recurrent exercise of “taking to machines” raises at least three critical questions. The first question concerns the opaque nature and inscrutability of these algorithmic forms of governance, which has been amply documented in the literature (see, among others, Pasquale, 2015; Smith, 2020). The scarce transparency and accessibility of algorithmic decision-making is amplified by the fact that they operate in the realm of machine learning, needed to “bring together again” data generated by scattered platforms and mechanisms and make sense of them (Aradau & Blanke, 2022, p. 106). Some have even argued that these developments represent a threat to constitutional democracy in virtue of the power concentration they harbour (Nemitz, 2018).

The second critical question posed by the rapid advance of algorithmic regimes in society has to do with the potential social costs of these mechanisms of generating knowledge and validating it, as the Dutch case exposes. Research has detailed how it is often disadvantaged communities and individuals at the fringe of society that suffer the worst consequences (cf. Lutz, 2019; O’Neil, 2016). A running list of data harms includes the

exploitation that might arise from the profiling of people; discrimination; loss of privacy; surveillance, control and physical injury; manipulation (for example, of voting behaviour); exclusion from the necessities for life, such as government subsidies, as well as injustice resulting, for instance, from the use of predictive technologies for politicking (Redden, 2022). Eubanks (2018) goes as far as maintaining that to understand the future of invasive technology, we ought to look at poor communities since it is where expectations are lower than people's rights such as privacy will be upheld.

The third critical question raised by algorithmic mediation as our privileged way of knowing the world has to do with the generative qualities of algorithmic systems: by producing knowledge and truth claims, algorithms influence the likelihood of certain realities above others. In so doing, these new "knowledge regimes" (Jarke et al., in this volume) can reshape our views, including the formation of political opinions, fuelling a sort of "algorithmic governmentality" (Rouvroy & Berns, 2013). Think of the Cambridge Analytica scandal, whereby information volunteered by Facebook users on the platform was appropriated for profiling and microtargeting, with the goal of influencing the outcome of the 2016 US presidential elections. While there is no consensus over the effectiveness of political microtargeting and/or recommender systems (cf. Poehhacker et al., in this volume), this case exposes how this "new mode of 'truth-doing'" results in "knowledge for the government of individuals and populations" (Aradau & Blanke, 2022, pp. 22–31).

Starting from these observations, I hold that the advance of algorithmic regimes in society is to be seen as the manifestation of a (relatively new) form of governance which I term "governance *by* data infrastructure." Governance *by* data infrastructure is capable of moulding social interactions in ways that can jeopardize citizen agency. The commentary is structured as follows. First, it briefly describes the main features of governance *by* data infrastructure. Second, asking what kind of knowledge is produced by these practices and what publics are evoked (and with what consequences), it reflects on the loss of citizen agency associated with this form of governance of the polity.

The Rise of Governance *by* Data Infrastructure

The new modes of machine learning-mediated knowledge production, validation, and dissemination typical of algorithmic regimes are made possible by an array of data infrastructure generating ever-larger quantities

of data and setting the conditions for data processing. Examples of data infrastructure include the dashboards that oversee service delivery in the smart city (Coletta et al., 2019), the biometric identification systems adopted by law enforcement agencies across the world (Jansen et al., 2021), and commercial gender classifiers powering consumer facial recognition services (Buolamwini & Gebru, 2018). Intervening in an expansive list of social activities, these data infrastructure produce information that enable “real-time decision-making” (Amoore, 2011, p. 24). Because data inform regulation and regulate human behaviour, these regulatory data infrastructures, as we may call them, increasingly take up functions and roles that were once performed by humans and pertained (almost) exclusively to governments and public administrations. They fuel a form of governance that elevates regulatory data infrastructure to the preferred mode of management of complexity. They intervene in the fulfilment of fundamental state functions in the domains of public safety, health, education—and counting.

This does not happen without friction. The “care and cure” of infrastructuring, as noted by Boeva and Kropp (in this volume), entails “contested arrangements and actors struggling for their interests in the implementation of emerging technologies” (p. 142). And because “arrangements of technical architecture are inherently arrangements of power” (DeNardis, 2012, p. 721), the shift to governance *by* data infrastructure marks a significant transformation. It puts the tech industry in an unprecedented position of power and “fosters novel power relations among public and private actors,” not all of them desirable (Bellanova & De Goede, 2020, p. 102). When implemented in state service delivery, for instance, for-profit contractors function as “regulatory agents, turning private centers of power to state purposes” (Braman, 2006, p. 34) and diverting action and control away from the public administration and elected legislators. What’s more, this often happens—as the Dutch case well illustrates—outside established mechanisms of democratic scrutiny. Second, data infrastructure contributes to coalesce *a scaffolding of* algorithmic regimes that may last a long time and lends itself to be continuously repurposed to gather more data and generate other knowledge (Milan et al., 2021; see also Büchner et al., in this volume). Digital identity systems are a case in point, as they connect identity authentication to commercial facilities like banking or to welfare state services such as healthcare or food subsidies. In other words, these “foot-in-the-door devices” lay the “groundwork for future adoption of features that might earlier have been rejected as unacceptable or unnecessary” (Pierce, 2019, p. 11). Finally, as the societal dependence on

regulatory data infrastructure and the subtending algorithmic regimes get progressively domesticated and normalized, it is increasingly difficult if not impossible to opt out. Education technology is a paradigmatic example: parents and pupils can do little against the introduction of datafication in the school system at all levels (for an overview of problems, see Jarke & Breiter, 2019). I contend that, in the long run, governance *by* data infrastructure will shift power and state-making abilities away from the state and to the private sector, augment inequality, and deeply affect our ability to exercise citizenship.

What Knowledge and What Publics?

What kind of knowledge is produced by all-pervading algorithmic regimes and what kind of publics are evoked—and what and who is, on the contrary, obscured or marginalized? Literature from various disciplines, including science and technology studies (STS), critical data studies, fairness and accuracy in computing but also politics, is awash with critical accounts of incumbent algorithmic regimes in relation to justice, fairness, and inequality. Here I want to refer to two key aspects to speak to the “discursive dimension of public formation and the role of technologies in the shaping of those discourses” (Møller Hartley et al., 2023, p. 3).

The first concerns the power to define realities (and obscure other, competing ones) typical of algorithmic regimes, which I have illustrated above with the example of Cambridge Analytica and that bears a strong connection with the notion of “prediction regimes” explored by Egbert (in this volume). With respect to the civic community, we note how the generative qualities of these systems are potentially transformative of the type of society and polity we live in. This is, among others, because data generated by algorithmic regimes is “fed back to citizens as representations and mirroring of themselves via metrics, such as likes, clicks and shares. In turn, users respond to this mirroring” (Møller Hartley et al., 2023, p. 3). With the technological acceleration of society, things become more complex—towards a change of paradigm (Kitchin, 2014) that subtends to *a systemic change* which is also a point of no return. The introduction of deep learning is “generative of new norms and thresholds of what ‘good,’ ‘normal,’ and ‘stable’ orders look like in the world,” claims Amoore (2022, p. 2). This emerging “machine learning political order” is thus not merely about “supplying new instruments and apparatuses of classification or taxonomy for the governing of society, but is *itself* a reordering of that politics,

of what the political can be” (ibid., pp. 2–3; original emphasis). Needless to say, citizens rarely have a say in what this “prototypical model of society” (ibid., p. 2) ought to look like. Yet, as Amicelle and colleagues observed, the performative power of technology can redefine the borders between the normal and the abnormal, incorporating substantive forms of inequality along the way (Amicelle et al., 2015).

The second refers to the experimental and trial-and-error approach that often characterizes the design and operation of algorithmic regimes, although this rarely features in the mainstream imaginaries associated with these technologies and discounts its potential detrimental effect on the public debate. This approach, typical of software design, may be at odds with the functioning of liberal democracy, e.g., with respect to the notion of the sovereign people. In addition, the opacity of algorithmic regimes means that affected individuals are typically unable to seek redress (Benjamin, 2019). Often such experimentation goes to the detriment of those it purports to benefit. It is the case of the Colombian SISBÉN, a household targeting system supporting social programmes for the poor and the vulnerable. The various iterations of this algorithmic regime aimed at identifying inconsistencies in population records to reduce the number of people who could access social benefits. It also shifted the focus away from the political problem of poverty, and the state inability to solve it, reducing it to a technical problem of technology design (López, 2020).

From this cursory view, we gather that the formation of (democratic) publics evoked by algorithmic regimes is not only in continuous transformation, but also under threat, for the knowledge algorithmic regimes produce and value, and the way they do it and mobilize said knowledge, eat into the citizens’ ability to act in the world—a claim I explore next.

The Erosion of Citizen Agency

The shift to algorithmic regimes as the main mechanism supporting knowledge production and dissemination is “not merely technological, but also social and political, and it therefore confronts us with questions of power, agency and control” (Hintz et al., 2018, p. 2). The move towards governance *by* data infrastructure in the transfer of agency, control, and sovereignty away from the citizens and consumer to non-human agents. The logical “layers”—algorithms, but also standards and protocols—play a key role in determining the intended outcomes of knowledge production, including “ranking” certain types of knowledge over others. Gritsenko and Wood

have aptly referred to “design-based governance, with power exercised ex ante via choice architectures defined through protocols, requiring lower levels of commitment from governing actors” (2020, p. 1). Power, therefore, shifts away from users and other entities, such as governmental agencies, towards the designers, standards organizations, and vendors that build and sell algorithmic systems.

Citizen agency is eroded as a result. Citizen agency is here intended as reflexive practice oriented to (political) action, such as our ability to exercise and *enact* citizenship. It is the result of the process of “making sense of the world so as to act within it” (Couldry, 2014, p. 891). Importantly, this process is “interactive and shared,” as Melucci observed about a concurrent dynamic, that of collective identity in groupings, which is “constructed and negotiated through a recurrent process of activation of the relations that bind actors together” (1996, p. 70). In other words, citizen agency does not much exist in the guise of individual possibility, as much as it does in its collective nature and the promises (of change) that this collective dynamic holds.

But our interactions today are increasingly mediated by algorithms, with mixed consequences as this section of *Algorithmic Regimes: Methods, Interactions, and Politics* made clear. The collectives that are summoned by algorithms are assembled on the basis of predicted commonalities. As we have seen, these algorithmic regimes are more often than not crystallized in variably stable assemblages that are opaque, unidirectional, and unfair. Elevating algorithmic regimes to the main arbiter of interactions between people and between people and the state, the penetration of governance by data infrastructure in society harbours the risk of restricting the boundaries of citizen agency even further. Yet, as there are margins of errors in algorithmic regimes, there are pockets of resistance, creativity, and subversion able to reclaim agency. Meanwhile, methods to foster algorithmic literacy, as explained by Eslami and Heuer (in this volume), and initiatives to promote algorithmic awareness (see the chapter by Storms and Alvarado) have an important role to play as we move towards more and more pervasive algorithmic regimes. The “vanguard” amongst the citizenry—for example, those “data activists” whose data crunching skills are put at the service of the common good—can act as “translators” (Gutiérrez, 2018) of complex socio-technical dynamics, capable of mitigating the disempowerment of laypersons in the face of all-encompassing algorithmic regimes. And promoting “alternative epistemologies” (Milan & van der Velden, 2016) of algorithmic regimes, data activists can contribute to change the way we “talk to machines” in the near future.

References

- Amicelle, A., Aradau, C., & Jeandesboz, J. (2015). Questioning security devices: Performativity, resistance, politics. *Security Dialogue*, 46(4), 293–306. <https://doi.org/10.1177/0967010615586964>
- Amoore, L. (2011). Data derivatives: On the emergence of a security risk calculus for our times. *Theory, Culture & Society*, 28(6), 24–43. <https://doi.org/10.1177/0263276411417430>
- Amoore, L. (2022). Machine learning political orders. *Review of International Studies*, 1–17. <https://doi.org/10.1017/S0260210522000031>
- Aradau, C., & Blanke, T. (2022). *Algorithmic reason: The new government of self and other*. Oxford University Press.
- Bekker, S. (2021). Fundamental rights in digital welfare states: The case of SyRI in the Netherlands. In O. Spijkers, W. G. Werner, & R. A. Wessel (Eds.), *Netherlands Yearbook of International Law 2019: Yearbooks in International Law: History, Function and Future* (pp. 289–307). T. M. C. Asser Press. https://doi.org/10.1007/978-94-6265-403-7_24
- Bellanova, R., & De Goede, M. (2020). The algorithmic regulation of security: An infrastructural perspective. *Regulation & Governance*, 16(1), 102–118. <https://doi.org/10.1111/rego.12338>
- Benjamin, R. (2019). *Race after technology: Abolitionist tools for the New Jim Code*. Polity.
- Braman, S. (2006). *Change of state: Information, policy, and power*. MIT Press.
- Buolamwini, J., & Gebru, T. (2018). Gender shades: Intersectional accuracy disparities in commercial gender classification. *Proceedings of Machine Learning Research*, 81, 1–15. <http://proceedings.mlr.press/v81/buolamwini18a/buolamwini18a.pdf>
- Coletta, C., Evans, L., Heaphy, L., & Kitchin, R. (Eds.). (2019). *Creating smart cities*. Routledge.
- Couldry, N. (2014). A necessary disenchantment: Myth, agency and injustice in a digital world. *Sociological Review*, 62(4), 880–897.
- DeNardis, L. (2012). Hidden levers of internet control: An infrastructure-based theory of internet governance. *Information, Communication & Society*, 15(5), 720–738.
- Eubanks, V. (2018). *Automating inequality: How high-tech tools profile, police, and punish the poor*. St. Martin's Press.
- Gritsenko, D., & Wood, M. (2020). Algorithmic governance: A modes of governance approach. *Regulation & Governance*, 16(1), 45–62. <https://doi.org/10.1111/rego.12367>
- Gutiérrez, M. (2018). *Data activism and social change*. Palgrave Macmillan.
- Hintz, A., Dencik, L., & Wahl-Jorgensen, K. (2018). *Digital citizenship in a datafied society*. Polity.

- Jansen, F., Sánchez-Monedero, J., & Dencik, L. (2021). Biometric identity systems in law enforcement and the politics of (voice) recognition: The case of SiiP. *Big Data & Society*, 8(2), 20539517211063604. <https://doi.org/10.1177/20539517211063604>
- Jarke, J., & Breiter, A. (2019). Editorial: The datafication of education. *Learning, Media and Technology*, 44(1), 1–6. <https://doi.org/10.1080/17439884.2019.1573833>
- Kitchin, R. (2014). Big data, new epistemologies and paradigm shifts. *Big Data & Society*, 1(1). <https://doi.org/10.1177/2053951714528481>
- López, J. (2020). *Experimentando con la pobreza: El SISBÉN y los proyectos de analítica de datos en Colombia*. Fundación Karisma. <https://web.karisma.org.co/wp-content/uploads/download-manager-files/Experimentando%20con%20la%20pobreza.pdf>
- Lutz, C. (2019). Digital inequalities in the age of artificial intelligence and big data. *Human Behavior and Emerging Technologies*, 1(2), 141–148. <https://doi.org/10.1002/hbe2.140>
- Melucci, A. (1996). *Challenging codes: Collective action in the information age*. Cambridge University Press.
- Milan, S., Taylor, L., Gürses, S., & Veale, M. (2021). Promises made to be broken: Digital vaccine certification as hyperrealistic immunity theatre. *European Journal of Risk Regulation*, 12(2), 382–392. <https://doi.org/10.1017/err.2021.26>
- Milan, S., van der Velden, L. (2016). The alternative epistemologies of data activism. *Digital Culture & Society*, 2, 57–74. <https://doi.org/10.14361/dcs-2016-0205>
- Møller Hartley, J., Sørensen, J. K., & Mathieu, D. (Eds.). (2023). *Datapublics: The construction of publics in datafied democracies*. Bristol University Press.
- Nemitz, P. (2018). Constitutional democracy and technology in the age of artificial intelligence. *Philosophical Transactions of the Royal Society A: Mathematical, Physical and Engineering Sciences*, 376(2133), 20180089. <https://doi.org/10.1098/rsta.2018.0089>
- O'Neil, C. (2016). *Weapons of math destruction: How big data increases inequality and threatens democracy*. Broadway Books.
- Pasquale, F. (2015). *The black box society: The secret algorithms that control money and information*. Harvard University Press.
- Pierce, J. (2019). Smart home security cameras and shifting lines of creepiness: A design-led inquiry. *CHI '19: Proceedings of the 2019 CHI Conference on Human Factors in Computing Systems* (paper no. 45). <https://doi.org/10.1145/3290605.3300275>
- Redden, J. (2022). Data harms. In L. Dencik, A. Hintz, J. Redden, & E. Treré (Eds.), *Data justice* (pp. 59–72). Sage.
- Rouvroy, A., & Berns, T. (2013). Algorithmic governmentality and prospects of emancipation: Disparateness as a precondition for individuation through relationships? *Réseaux*, 177, 163–196.

Smith, G. J. (2020). The politics of algorithmic governance in the black box city. *Big Data & Society*, 7(2). <https://doi.org/10.1177/2053951720933989>

UN Office of the High Commissioner. (2019, October 16). The Netherlands is building a surveillance state for the poor, says UN rights expert. <https://www.ohchr.org/en/NewsEvents/Pages/DisplayNews.aspx?NewsID=25152&LangID=E>

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