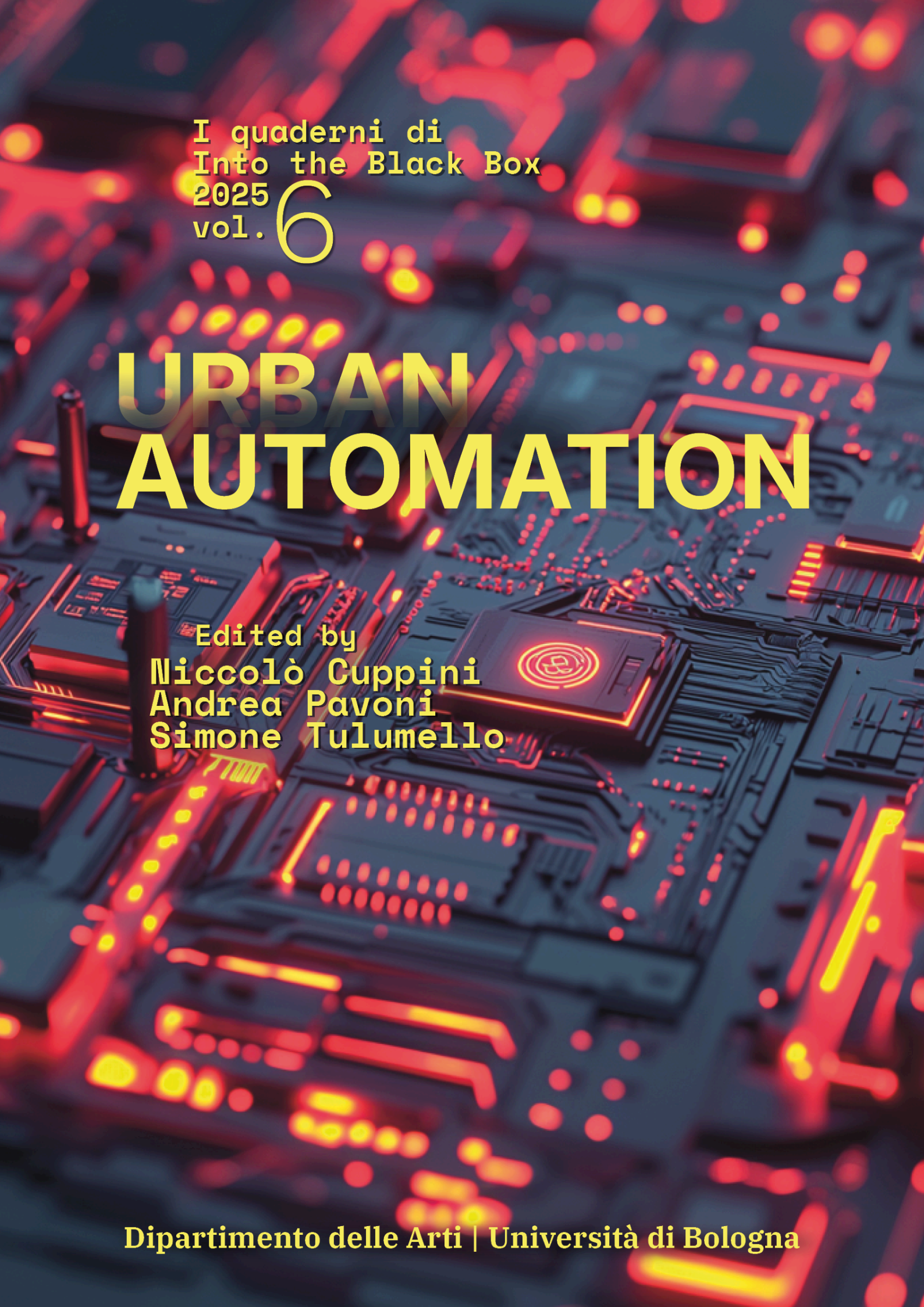

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URBAN AUTOMATION

Edited by
Niccolò Cuppini
Andrea Pavoni
Simone Tulumello

Dipartimento delle Arti | Università di Bologna

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DIPARTIMENTO DELLE ARTI
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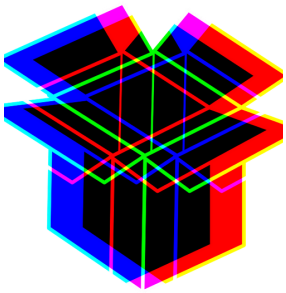

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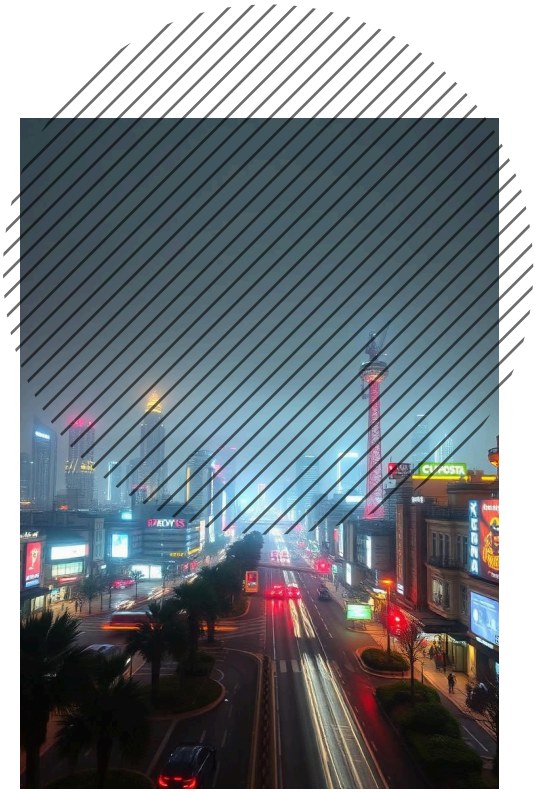


INTRODUCTION

Introduction

Niccolò Cuppini, Andrea Pavoni & Simone Tulomello

US stocks dropped sharply, on January 27, 2025, pushed down by the fall of NVIDIA, which lost something on the house of 600 billion USD in market value. The technology corporation had had a boom, in the previous couple of years, becoming for one day (June 18, 2024) the most valuable company in the world: its latest generation, powerful chips and processing units had become inextricably linked with the explosion of generative AI and large language models (LLM) produced by tech giants of the likes of OpenAI, Google and Microsoft. On January 20, 2025, DeepSeek a Chinese company released R1, an open-source LLM considered to be as if not more effective than Western competitors (chatGPT, Gemini, Copilot…), but requiring a fraction of computing power and developed with much lower costs. Hence, the fall of NVIDIA – for the time being, at least – and the crisis of assumptions about the future of AI as being interlinked with enormous amounts of money and energy to be invested.

The meteoritic rise of DeepSeek has been seen in many ways: as a catastrophe for the trillions of USD invested in North-American AI models; as an amazing story of an underdog that made the best of the sanctions that prevented Chinese competitors to access US and Western

technology; as yet another hard-to-predict development of a rapidly unfolding field. But there is more: if one googles DeepSeek, the descriptor line on the web search states: "DeepSeek, unravel the mystery of AGI [Artificial General Intelligence] with curiosity. Answer the essential question with long-termism" – a puzzling affirmation. A story that seems to incapsulate the troubles and promises of generative AI and, by extension, automation.

It was in the very spirit of engaging with the troubles and promises of automation at the urban level that we launched, some months ago, the call that gave origins to this volume.

We had three aims: first, to address the spatialization of automation, investigating the modes, dynamics, and vectors through which automation processes manifest in urban terms, employing a geographic lens for analysis; second, to engage conceptually, exploring what "urban automation" means and its interpretive and epistemological potential as a theoretical framework; and, finally, to leverage these discussions to reflect on the nature of critique in contemporary contexts – to think about troubles and promises beyond the dichotomic approaches that dominate the field.

As it is always the case with the advent of seemingly revolutionary technological shifts, on the one side we find the "techno-utopians": a heterogeneous group characterized by positions that range from naïve and ideological to politically or utilitarian-driven. Here, automation, and AI urbanism at large, appear as teleological, progressive forces, devoid of – or capable of overcoming – conflict, inequality, and environmental impacts. On the other side, automation is framed as a technodystopia – a domain of vicious command and centralization, aimed at deepening labor and resource exploitation, emphasizing alienation and ecological harm.

Simplifying through imagery: one vision portrays automated urban environments as sustainable, consensual and equal paradises of comfort, where life is smoothly organised, efficient and just-in-time – a logistical dream. This is how cognitive cities like The Line are presented in marketing pitches. In an interview published in the official website, The Line's CEO Gilles Pendelton observes that 'Data allows you to map behaviour and create predictability with patterns of people, what they do and what they want'. This means, he hastens to add, that this is 'actually a human-centric approach, using machines to process large volumes of data to come up with optimal solutions. And it's a virtuous circle because the more the system learns, the bigger the data pool and the more accurate the algorithms become'. That adequately sums up the perfect sum game that the virtuous, AI-filtered feedback loop between citizens and the city would supposedly bring about. This Newtonian view sees the quintessential problem of urban governance as friction – that is, the extent to which the movement of people, things and desire is slowed or bogged down by physical, bureaucratic or political obstacles. The quest for having 'the best quality of life on the planet', according, passes through the mission to give time, and thus life, back to the citizens by means of removing hinders and constrains: 'The more time we can give back to the individual to declutter their lives, the better' (ibid, our emphasis). Urban automation, as the promise of a diffused

[1] https://www.neom.com/en-us/regions/theline

delegation of the inconvenient (cf. Gehlen, 1998[1974]), is what declutters this revolution.

The other vision emphasises the highly problematic ways in which such hinders and constrains are removed, and the consequences. It envisions urban automation as unavoidably engendering a vast metropolitan prison and/or a totally commodified collective – a mechanical automaton, autonomously feeding, Matrix-style, on annihilated and over-extracted individuals.

Sublimating both perspectives in a dark dialectical synthesis is the rise and rise of techno-authoritarian or techno-fascist (Chayka 2025) [2] approaches to AI, extremely popularized at the moment by the central role played by Elon Musk and other billionaires 'tech-bros' in the second mandate of Donald Trump as president of the USA. In this context the belief in the capacity of technology – fundamentally, AI – to *solve* social problems is not presented in soothing idealistic tinges but rather with a hefty dose of dark cynicism. Here, there is no intention to deny the unequal, dystopian consequences envisaged by the critics – in fact, these are happily embraced in the name of a neoreactionary brand of social Darwinism bent on weaponizing the power of automation to profoundly restructure social life as a Hobbesian playfield where only the cleverest will survive (cf. Land 2022). Willing to navigate this complex and fast-evolving state of affair, this issue seeks to integrate both critical and reconstructive elements, transcending mere problem repetition. By engaging with the tensions between these polarities rather than the polarities themselves, we propose to spatialize automation by examining what is changing, for whom, and with what potential, while also speculating on urban futures.

There is a persistent theme these seemingly contrasting positions share. It is the implicit assumption that novel technologies are exogenous to the social, which they deeply shape in promising or threatening ways. This is a trick that has been typical of automation since its materialization in the factories of industrial modernity. It was Karl Marx, in the mythical 'Fragment on Machines' of the Grundrisse, to first explain the process through which automation comes to appear as external. 'The development of the means of labour into machinery is not an accidental moment of capital', he writes, 'but is rather the historical reshaping of the traditional, inherited means of labour into a form adequate to capital' (Marx 1973, 616). It is the tension between these 'inherited means of labour' and their *reshaping* to be of interest here. 'The accumulation of knowledge and of skill, of the general productive forces of the social brain', Marx continues, 'is thus absorbed into capital, as opposed to labour, and hence appears as an attribute of capital' [3]. In *The Eye of the Master*, which could be read as an extended elaboration on this very intuition, Matteo Pasquinelli writes: 'the epistemic imperialism of science institutions has obfuscated the role that labour, craftmanship, experiments, and spontaneous forms of knowledge have played in technological change' (2023, 84).

[2] https://www.newyorker.com/culture/infinite-scroll/techno-fascism-comes-to-america-elon-musk

[3] https://thenewobjectivity.com/pdf/marx.pdf

Likewise, it seems that much of the mainstream discourse on urban automation has *obfuscated* the role played by urban relations, practices, and 'spontaneous forms of knowledge' in feeding this technological change – including the role that pre-digital forms of 'urban automation' have played in propelling AI-powered urban automation. Urban automation is an ongoing process and a field defined by multiple tensions. It is an umbrella term encompassing diverse trends: urban digitalization (e.g., smart cities, platform urbanization, AI urbanism), the urban implications of Industry 4.0, the evolving nature of urban everyday life, labor cyborgization, and more. This multiplicity – from digital twins to smart and cognitive cities, from Smart to AI urbanism, and from Big Tech urbanism to urban hacking – is what makes this research path fertile. Let us explain, beginning with a simple question.

What is urban automation? A dynamic, a trend, a possibility, a project, a set of machines, an ecosystem, a field of political experimentation, and more. This conceptual elusiveness is, in itself, promising. Some clarifications are in order, however. Contemporary research on AI and the city highlights that AI urbanism is significantly different from Smart urbanism. In the introduction of a recent, comprehensive collection on the subject, the editors propose to understand this evolution along three main axes: *function*, *presence*, and *agency*. First, they note, AI urbanism can be understood as being more about *accounting* than *counting*. It provides an account of the urban condition (explaining how and why something occurs and making predictions on the future based on those considerations) rather than simply performing calculations on vast data sets as was supposedly the case with smart urbanism: 'AI uses Big Data to produce explanatory and interpretative models akin to narratives' (Cugurullo et al. 2024, 12). Second, explicitly signalling its presence with drones, robots, autonomous vehicles and smartphone notifications, AI urbanism is more overtly visible than was the case with its somehow opaquer predecessor. Third, drawing from Federico Cugurullo's (2020) influential suggestion, with AI we seemingly assist to a shift from *automation* to *autonomy*. While Smart urbanism is characterised by automatic protocols that do not seem to leave 'room for variations or improvisation' (Cugurullo 2021: 161), the explanatory, interpretative, and learning capacity of AI means a much wider room for independent agency, value judgements, and decisions – that is, *autonomy*.

We do not subscribe completely with this axial account, although we are well aware that its seemingly simplistic categorisation and temporalization are to be understood as having a heuristic value with respect to the introductory purpose of the volume, rather than pretending to literally reflect the reality of AI urbanism, where all sort of complex spatio-temporal overlapping appear to be in place. In fact, this account is rather useful insofar as opening of a promising laboratory of reflection to think and investigate 'post-smart' urbanism. For obvious reasons, in this context we are particularly interested in the third axis.

In his philosophical meditation on the notion of automata, Carlo Sini (2009) observes that two contradictory meanings are entangled within this term. The first has to do with *autonomy*: that is, the capacity of something to move, act or think independently. The second has to do

with heteronomy, that is, the condition of being dependent on an external agent. The automata can be understood in both senses: as a puppet constrained by the necessity of its external guidance, like the mythical Mechanical Turk; or as something that is free to act autonomously, like of Golem, or a human being. Is that so, though? As we know, from philosophy to neurology, the belief in free will has been extensively problematised for both its presuppositions and its political-ethical consequences. While there is neither need nor room for rehashing this debate here, suffice to say that autonomy and heteronomy appears to be as coexistent dimensions of social life and its socio-technical field. While we acknowledge that the automation/autonomy distinction can have heuristic value in highlighting the differences that AI urbanism introduces with respect to the previous socio-technical condition, at the same time we believe that the concept of urban automation does not lose strength in a post-smart socio-technical field. The urban is a socio-technical field that is shaped by technological innovation in a recursive process that tends to progressively infrastructure its socio-material fabric. This process, particularly evident in the digital age thanks to the degree of penetration of digital technologies, unfolds in dynamic coevolution between technologies and techniques, digital infrastructuration and forms of life (Borghi 2024). The result is an everyday onlife where autonomy and automation are not only features of specific technologies but also polarities of the resulting socio-technical field, which will oscillate between them, depending on spatial and temporal conditions. Automation, in other words, appears as a central feature of an urban fabric that is digitally infrastructured at an ever-accelerating pace. What we are suggesting, in a sense that is different from Cugurullo's argument, is that the autonomy/automation dialectics can be see not only from the point of view of an evolution occurring within a specific technology – e.g. from Smart to AI urbanism – but as the two polarities through which the urban fabric organised, between temporally autonomous and automated spacetimes. Autonomy and heteronomy, in other words are present simultaneously, in complex and often contradictory ways, in the contemporary urban.

The argument becomes clearer once the perspective on urban automation is expanded historically, that is, once automation is understood as a facet of urban life – social life in general, that is – well before the digital revolution. As Alfred North Whitehead (1911) famously wrote: 'Civilization advances by extending the number of important operations which we can perform without thinking of them'. In fact, the capacity for a collective to function for a large part 'automatically' is something that has interested sociologist since the emergence of the discipline. Unsurprisingly, this was a particularly cogent matter at the advent of urban modernity, where an unprecedented amount of unrelated beings found themselves sharing a common field of work, leisure, movement, interaction and desire. How does order emerge out of this mess is something that has puzzled urban thinkers from Gabriel Tarde to Georg Simmel, from Elias Canetti to Erwin Goffman. Especially in the latter's work, urban life is depicted as emerging out of a continuous cycle of repetition, adjustment, habituation, and self-regulation, an

immanent ordering where social automatisms such as 'normal appearances' or 'civic inattention' guarantee the osmotic harmonization of everyday life. A harmony, needless to say, that has always depended on a good deal of violence. It is not too much of a stretch, then, to understand these as early reflection on urban automation, a kind of automation that obviously occurred at a significantly different degree of technological exosomatisation from the contemporary context [4]. Looking at the surfacing of AI urbanism from this viewpoint might prove rewarding. Let us resort again to Pasquinelli and his general observation that, when it comes to explain AI, one needs to consider 'the relationship between labour, rules, and automation' (2023, 3). Let us rephrase. When it comes to AI urbanism, we suggest, one needs to consider the way it reshapes the relationship between life, rules, and automation. It is most importantly in this context that Pasquinelli's subsequent observation particularly resonates, namely that 'the "intelligence" of technological innovation' has often originated from the imitation of […] abstract diagrams of human praxis and collective behaviours (2023, 6). Imitation, reproduction, substitution. Take, for instance, the evolution of urban orientation, that is, the exquisitely modern problem of finding one's way through an increasingly 'displaced' urban space, from 19th century planning to 21th century location-based services (Chamayou 2014; Halpern 2015; Brighenti & Pavoni 2023). More generally, the evolution of digital urbanism can be said to emerge from, code, crystallise, and reconfigure the 'abstract diagrams of human praxis and collective behaviours' which were pre-existent to this evolution, while generating novel articulations in the process. This can be seen exploring the different ways in which the mostly unconscious automatisms of everyday life that Goffman and others described are increasingly exosomatised on non-conscious machine-to-machine interactions (Brighenti & Pavoni 2022). The consequences of this 'automation of automation', as Pasquinelli put it, are remarkable.

As Bernard Stiegler has particularly explored, automation, like a *pharmakon*, has ambivalent potential: it simultaneously liberates individuals from repetitive, uncreative and exhausting tasks, while threatening to erode their capacity to do,

[4] As Brighenti and Pavoni remind: 'Goffman was not unaware of the possibilities inherent in the technological prolongations of perception, and the 'ever-extending network' produced by 'artificial receptors of various kinds, such as telephone, telegraph, radar screens, and the like' (Goffman 1971: 253-4). These, he recognised, may enlarge the individual Umwelt in remarkable ways. In this sense, his reflection can be easily accommodated with the development of further new media'. They further note, however, that the 'today, it is less a question of social interactions adapting and adjusting to the contingency of their own unfolding, and increasingly more a matter of urban space itself adapting in real time to social interactions which, however, come already coded, mediated, formatted, and increasingly even 'pre-comprehended' by digital sieving and artificial intelligence algorithms.' Brighenti AM & Pavoni A (2022). Goffman back in town. On new relations in public. Etnografia e Ricerca Qualitativa 15(1):93-114, DOI: 10.3240/103746

think and feel. This is the ambiguous potential that early theorists of accelerationism like Nick Land and his fellow theorists at Warwick's Cybernetic Culture Research Unit saw as promisingly embodied in 'automated' music genres such as Techno or Jungle (Eshun 1998). Of course, as Land's own trajectories obliquely reminds, this 'liberation' has its own dangers. The systematic outsourcing of functions to the machine – its general automation – threatens to dissolve the ethical dimension, as delegation of responsibility turns into a generalised loss of our ability to be individually and collectively responsible, that is, able to respond to radical difference (cf. Haraway 2008). The potential value of automation in this sense hinges on projects that transcend this ambivalence, unleashing new human energies at a higher level, by making 'possible the delegation of functions that were previously performed by human beings, but only on the basis of a complete rethinking of the social project' (Stiegler 2020, 235). At the same time, automation can also be read in the context of that expansion of the frontiers of value extraction that Mezzadra and Neilson (2019) describe as typical of the operations of capital: the production of immanent outsides through which the capital opens up spacetimes of potential valorisation – which, of course, simultaneously become powerful frontiers of surveillance, control, and violence. The intersection of socio-technical and political economic aspects in the evolution of contemporary AI urbanism requires a critical approach that would understand it, at least partially, as 'a project to capture the knowledge expressed through individual and collective behaviour and encode it' (Pasquinelli 2023, 2). At the same time however, as Stiegler and Simondon taught us, the reflection cannot stop to that critique either. Urban automation, and AI urbanism, constitute a complex sociotechnical field whose potentialities are only myopically and paranoidly read as merely at the service of the capital, or as necessarily debilitating vis-à-vis some kind of more original, authentic or pure socius. By exploring the intersection of urbanization and automation, this issue highlights strategies to liberate the collective potential for thought, imagination, and action generated by this new socio-technical milieu. Living the ambivalence, staying with the trouble: a new form of critique and imagination for urban automation from a multifaceted perspective is the research terrain we hope this issue will open.

In the afterword, we ask Matteo Pasquinelli to apply his reflections on automation to collective intelligence. The urban can be conceived as a product of thoughts, affects, and interactions – how does automation operate in this context? How does Marx's General Intellect and its automation apply to the spatial and socio-material dimensions of the city? It both captures and acts within a context where the increasing pervasiveness of platformization processes modifies how the urban is produced and radically transforms the very experience of urbanity (as well as rights, the economy, and more)?

It is possible, then, to highlight not only how the "spontaneous relationships" that emerge in the urban are captured and operationalized by digital automation processes, but also what new relationships are enabled by the latter? More profoundly, rather than dichotomizing these two areas, we attempt to view urban automation as a field in which the

boundaries between the human and the machinic are open to be blended and redefined.

Starting from this vast and complex research field, this issue includes highly diverse contributions, as we will move to discuss. Before, it is worth pausing for a moment and notice a significant lack of diversity in the issue: among the proposals we received there have been none with women or non-cis-gender persons among the authors. We, as editors, could had indeed done better, by working further to invite and attract more and different authors; and yet – not as a matter of excuse but of making sense – we must also be aware that we find here reproduced the masculine problem that has long characterized the fields of high-tech, AI and automation. What this implies for the possibility of thinking critique beyond dichotomic thinking is a question we prefer to leave open for the time being.

The contributions by Giovannini and Crisóstomo effectively showcase and traverse the two poles of the urban automation tension field we have previously investigated. The former explores the role of AI-powered humanoid robots in urban automation under platform capitalism from a social psychoanalytic and labor automation perspective. Challenging the ontology of AI humanoid robots as imitations of individual natural intelligences, Giovannini frames them as infrastructural agents of urbanization, where capital valorizes through the production of de-corporized subjectivities and the Intensification of the oppression and exploitation of natural bodies. Conversely, Crisóstomo highlights how automation is both a dream and a trap, exploring the speculative horizons of automation through the case study of the platform-based food delivery sector. The author examines how the promises of automation in this sector coexist with the actual conditions of labor.

These two contributions thus address both the aspects of the dark optimism of technocratic projections promoted by corporate companies (extendable to techno-authoritarian scenarios of cities "run like Amazon") and the imaginaries of technocratic solutionism. Beyond the intellectual comfort of deconstructive critique, their discussion on AI-powered humanoid robots and forms of last-mile urban logistics automation opens up a nuanced reflection on how these devices are concretely redefining the limits and possibilities of contemporary urban life.

The theme of "duality" also frames Iapaolo's contribution, an interview with Orit Halpern and Robert Mitchell, authors of the 2023 book *The Smartness Mandate*. The history and concrete implementation of "smartness," which can be framed as the primary source of imaginaries and projects of urban automation, evokes smartness' dual potential as a lens for critically engaging with digital capitalism and as an opening toward transformative change. Throughout the dialogue, the complexity and diversity of the theme are presented, blending ideology and a constellation of technologies and practices that weave together Artificial Intelligence, finance, urban design, and planetary governance. Indeed, this interview (and the book on which it is based) constitute an important instance of a critique that engages with the dominant imaginaries fueling automation vis-à-vis urbanity in the present by not excluding the possibility of alternative: there are other modalities and other futures of automation that are

already populating the present, although often dormant or buried beneath discourses unable to see the potential for the contradictions.

Contradictions that can hardly be unraveled without emphasizing the temporality of urban automation. This is the focus of Blotta's contribution, which delves into the complexity of the temporalities of automation, rejecting the assumption that it belongs to a specific epoch or technology. Automation does not solely pertain to the digital present-future. Human-non-human ecologies, as observed above, have always developed degrees of automation, as various sciences, from neuropsychiatry to interactionist sociology, have shown. Algorithmic techniques, for instance, are millennia-old, far predating the very term we use to define them, as Jean-Luc Chabert demonstrated. Blotta, following the recent work of Pasquinelli, develops a genealogy of automation, showing that its development has not only been about creating machines with ever-greater computational capacities but also about imitating and automating the collective behavior of the common. What has occurred is better understood as an "automation of automation", as Pasquinelli describes it: a process of gradual control, capture, and valorization of the general intellect increasingly predicated on neoliberal capitalism. This is not to say that a Marxist approach to automation is the only one available. Following thinkers such as Gilbert Simondon, we also emphasize that other possibilities exist to explore (urban) automation as a socio-technical emergence not reducible to the broader socio-economic context.

Finally, Biscossi's contribution addresses the relationship between computational automation and urban life by engaging with critical technology studies and cybernetic thought, specifically focusing on the emancipatory perspectives on automation emerging from speculative theory and art-driven technical practices. This perspective provides a fitting conclusion to this introduction. The assemblages of bodies and technologies within urban automation, the power relations inscribed in them, as well as the conflicts and latent alternative potentials, allow us to challenge the collective hypnosis of criticism. Instead, through the various contributions to this special issue, we aim to emphasize the necessity to historicize, demystify, and therefore de-fetishize urban automation, paying attention not only to historical recurrences but also to highlighting its contradictions, weaknesses, and fractures. Much like a small Chinese start-up has been able to jeopardize trillions of investments in mainstream AI, it is time to think how to jeopardize, and reinvent, the powerful operations of urban automation.

References and Further Reading

D. W. Bates, *An Artificial History of Natural Intelligence. Thinking with Machines from Descartes to the Digital Age*, Chicago, University of Chicago Press, 2024.

V. Borghi, *Infrastrutture: un metodo di lavoro per un cantiere di ricerca*. In V. Borghi & E. Leonardi (ed), *Il Sociale messo in forma*, Orthotes, 2024.

A. M. Brighenti & Andrea Pavoni, On urban trajectology: algorithmic mobilities and atmocultural navigation, *Distinktion: Journal of Social Theory*, 2021, DOI: 10.1080/1600910X.2020.1861044

A. M. Brighenti & A. Pavoni, Goffman back in town. On new relations in public, *Etnografia e Ricerca Qualitativa* 15, 1, 2022: 93-114.

J. L. Chabert, "Introduction," in *A History of Algorithms: From the Pebble to the Microchip*, ed. Jean-Luc Chabert, Springer, 1999.

G. Chamayou, Patterns of life: A very short history of schematic bodies, *The Funambulist Papers*, 2014, 57. https://thefunambulist.net/history/the-funambulist-papers-57-schematic-bodiesnotes-on-a-patterns-genealogy-by-gregoire-chamayou

F. Curugullo, Urban Artificial Intelligence: From Automation to Autonomy in the Smart City, *Frontiers in Sustainable Cities*, 2, 38, 2020.

F. Cugurullo, *Frankenstein urbanism: Eco, smart and autonomous cities, artificial intelligence and the end of the city*, Routledge, London and New York, 2021.

K. Ehun, *More Brilliant Than the Sun: Adventures in Sonic Fiction*, Quartet Books, 1998.

A. Gehlen, *Man, His Nature and Place in the World*, New York, Columbia University Press, 1988[1974].

M. Graham, R. Kitchin, S. Matter & J. Shaw (eds), *How to Run a City Like Amazon, and Other Fables*, London, Meatspace Press, 2019.

O. Halpern, *Beautiful data: A history of vision and reason since 1945*, Durham, Duke University Press, 2015.

O. Halpern & R. Mitchell, *The Smartness Mandate*, Boston, MIT Press, 2023.

D. Haraway, *When Species Meet*, Minneapolis, University of Minnesota Press, 2008.

Y. Hui, *The Question concerning Technology in China: An essay in Cosmotechnics*, Cambridge, MIT Press, 2019.

Into the Black Box, *From resistances to reclaiming. Towards different future ecosystems*, 2023: http://www.intotheblackbox.com/events/from-resistances-to-reclaiming/.

N. Land, *The dark enlightenment*, Baldwin City, Imperium Press, 2022.

J. Lepore, *Scientists use big data to sway elections and predict riots - welcome to the 1960s*, 2020: https://www.nature.com/articles/d41586-020-02607-8.

S. Mattern, *Mission Control: A History of the Urban Dashboard*, 2015: https://placesjournal.org/article/mission-control-a-history-of-the-urban-dashboard/?cn-reloaded=1&cn-reloaded=1&cn-reloaded=1&cn-reloaded=1.

K. Marx, *Grundrisse: Foundations of the Critique of Political Economy*, Penguin Books, 1973.

S. Mezzadra & B. Neilson, T*he politics of operations. Excavating contemporary capitalism*, Durham, Duke University Press, 2019.

O. Palmini & F. Cugurullo, Charting AI urbanism: conceptual sources and spatial implications of urban artificial intelligence, *Discovering Artificial Intelligence*, 3, 15, 2023.

M. Pasquinelli, *The Eye of the Master: A Social History of Artificial Intelligence*, New York-London, Verso, 2023.

D. Routhier, *With and Against: the Situationist International in the Age of Automation*, New York-London, Verso, 2023.

L. Russell, *Glitch Feminism: A Manifesto*, London, Verso, 2020.

S. Sadler, *Archigram: Architecture without Architecture*, Boston, MIT Press, 2005.

A. Sandhu & P. Fussey, The 'uberization of policing'? How police negotiate and operationalise predictive policing technology, *Policing and Society*, 31, 1, 2021, 66-81.

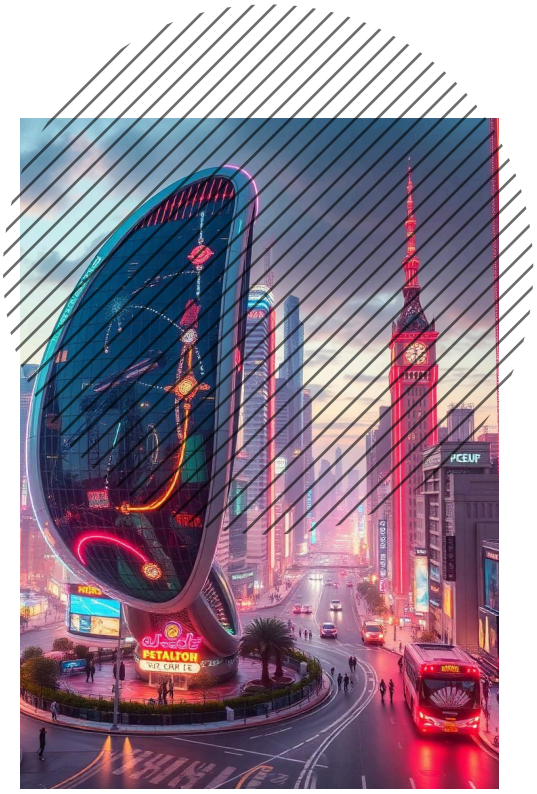
C. Sini, *L'uomo, la macchina, l'automa: lavoro e conoscenza tra futuro prossimo e passato remoto*, Torino, Bollati Boringhieri, 2009.

B. Stiegler, *Automatic Society, Vol. 1: The Future of Work*. Cambridge, Polity, 2016.

B. Stiegler, *Nanjing Lectures (2016-2019)*, Open Humanities Press, 2020.

A. N. Whitehead, *An Introduction to Mathematics*, Oxford, Oxford University Press, 1968.

CHAPTER 1



CHAPTER 1

AI Human Robots and the re-corporisation of urban subjectivities

Federico Giovannini
University of Bologna

The present essay explores the role of AI-powered humanoid robots in urban automation under platform capitalism from a social psychoanalytic and labour automation perspective.

Contrary to the ontology of AI-humanoid robots as imitation of individual natural intelligences, I will frame them as infrastructural agents of urbanization in which capital valorises through the production of decorporised subjectivities and the intensification of the oppression and exploitation of natural bodies.

By charting the urban geometries of death anxiety, I will foreground AI humanoid robots as a field of struggle between capitalist valorisation and subjective re-corporesaition.

What is at stake is both the existential capability to return to the natural body and its collective potency in materially and politically building the commons through the re-invention and re-appropriation of AI.

Firstly, I will show how death anxiety plays a role in urban subjectivation under capitalist processes of urban platformisation. I will do so by drawing attention to the existential and social body. Secondly, I will employ Pasquinelli's theory of labour automation to demystify the capitalist transurbanist imaginary on AI. I will do so by applying both Pasquinelli and authors that de-naturalise AI (Palmini & Curugullo) to the concrete case of AI-humanoid robots. Finally, I will show how

AI-humanoid robots can be a site of re-appropriation and re-invention through the re-cognition of the existential fragility of natural bodies as well as of the collective potency of the social bodies. AI humanoid robots and AI in general can be re-designed as means to organize social struggle against capitalist exploitation and oppression and for the building of the commons.

Death anxiety, the body and capitalist urbanisation

I will explore the role between death anxiety and the social production of the body under capitalist platformisation of the city. In these processes the body is decorporised in two senses. On an existential level through the operations of capitalization of the self that emerge in processes of self-entrepreneurship and self-management (Cuppini et a. 2022, pp. 118, 119). In the latter case, the platformisation of labour entails a psychological process of "self-contract" by which one is constantly incentivized to produce oneself in performative terms under algorithmic mediation (Nicoli & Paltrinieri, 2024, p. 103).

What is at stake is a process of enclosure of the self by which one's own body and identity become a source of extraction under self-management and the body of the others becomes a source of competitive pressure to better perform. Hence, self-enclosure entails both the projection of death onto oneself in self-optimisation and onto the others in competition.

On a social level, the decorporisation processes happen through the processes of exploitation individually experienced by algorithmic subjectivities (Cuppini et al. 2022, p. 120).

These processes also produce forms of urban spatialization that increase the vulnerability of the natural body both in psychological and physical terms, the physical isolation of knowledge workers in remote work or through the individualization of bodies in urban mobility in the case of riders moving through the traffic through individual means of transportation.

Several processes contribute to the emergence of what we might term "decorporized subjectivities"—subjects shaped by an unfeeling of both the other's body and their own. Social distancing measures during the COVID-19 pandemic intensified death anxiety, linking the fear of mortality to the physical presence of others. Meanwhile, the expansion of privatized consumer spaces—such as malls, restaurants, and supermarkets—has reinforced individualistic encounters between living bodies, heightening affective indifference toward their presence.

The rise of abstract digital spaces has further exacerbated social isolation and fragmentation amid growing precarization and labor intensification. These conditions produce domesticated subjectivities that anchor social affects through digital and machinic mediation (Briziarelli & Armano, 2022, p. 55). Additionally, the proliferation of platform-based digital consumption has accelerated the personalization of space production, resulting in a "fragmentation of shared social realities and experiences" (Dammann et al., 2022, p. 2).

Platforms valorise these conditions by producing new decorporised subjectivities under labour and consumption. The labouring subjectivity that channels death anxiety onto one's own body in the

attempt to keep up with the algorithms of exploitation as with riders traversing the danger of traffic in individual means of transportation under algorithmic command. The consumering subjectivity that channels death anxiety on the body of the other through its representation in digital consumption and in physical commercial spaces in the service sector, whereby the consumer enjoys oneself through the exploited body of the other. The decorporising process consists of the negation of the presence of the body both in psycho-aesthetic terms and in social terms. The subjectivity of the *hikikomori* is an instance of processes of decorporisation that entail a combination of negativisation of the body of the other and the increase of death anxiety, as the body of the *hikikomori* enjoys the body of the other only through digital consumption and in physical social isolation.

AI Humanoid Robots as infrastructural agents

AI-Humanoid Robots have been and are being introduced in a variety of sectors: service, retail, hospitality, healthcare, entertainment, education, research, logistics, military, manufacturing, etc… (Mende et al. 2019; Curugullo, 2020; Yang & Chew 2020; Oravec 2022; Noble & Mende 2023). I will focus on two AI human robots from the entertainment sector, Sophia the robot and Harmony. Sophia exemplifies the political choreography of AI solutionism and techno-capitalist messianism. Marketed as a flagship "social robot," she gained global attention after receiving Saudi Arabian citizenship in 2018 and touring extensively to showcase her purported "intelligence" (Parviainen & Coeckelbergh, 2020). Though not commercially available, Sophia's performative existence reinforces the ideological imaginary of AI as a superior iteration of human cognition. Her juridico-political recognition as a citizen materially validates this ontological commensurability.

While Sophia is not yet commercially available, her marketing performance enables the imaginary of AI as qualitatively optimized version of human intelligence. The juridico-political recognition of her person as citizen materialises and valorises this ontological commensurability.

Amongst AI humanoid robots already commercialized in the entertainment sector we have sex robots such as Harmony by RealDolls, designed for companionship, offering conversational interaction and emotional responsiveness. Such robot is completely customizable in body parts, gender and behaviour: "Realdollx is an AI driven robotic doll system powered by the technology developed over the past several years. It features a modular head system with multiple points of actuation, which enables the doll to form expressions, move its head, and speak to you. The eyes can also move and blink, creating an experience never before possible with any doll. It is designed to run with customizable AI software "X-Mode", which allows you to create unique personalities and control the voice of your robot. With your Realdollx purchase you will receive the AI software and one year subscription to X-Mode, which is managed and distributed by RealDoll." (RealDoll)

Note that the robot is not only sold as a material good but a physical infrastructure for a social service of companionship, as the customization of behaviour of the physical doll depends on the commercial rent of the "X-mode" service. In other words, the physical proximity with the robot enables both a permanent capture

of data and the valorisation of capital through rent.

However, Sophia and Harmony do not constitute bettered imitations of natural bodies and intelligences. As Pasquinelli (2023) points out "the inner code of AI is constituted not by the imitation of biological intelligence but by the intelligence of labour and social relations" and as such "AI is a project to capture the knowledge expressed through individual and collective behaviours and encode it into algorithmic models to automate the most diverse tasks" (p. 2). Following Babbage's labour theory of the machine and his machine theory of value, he outlines that the "machine is built by the division of labour in order to achieve a more accurate calculation and extraction of surplus value" (p. 68). Automation is a process where the machine comes to imitate and replace a previous division of labour, thus producing a new division of labour that through the machine will allow a further calculation of labour and extraction of value from it.

Concerning the imitation of labour, AI automates the capture of previous and existing social production that is performed by natural intelligent labour, and it produces a new division of labour through the control (of flow, translation, repetition) of the existing and future social production. This production is enabled by the valorising information of human operators, namely social workers in different sectors where AI infrastructures are operative.

The mystification of labour occurs as reproductive and productive activities in the sectors of robot employment appear to be replaced by artificial intelligence, while they are on the hand expropriated from living bodies – often women – whose knowledge and behaviour is crystallised in the machinic performance and on the other hand they only ever partially substitute for human labour in these sectors.

The intensification of labour invests all workers and social actors whose labour is imitated by the robots, which are put in competitive pressure with them. This is particularly relevant for women as they face competitive and performative pressures in social reproduction (Sinclair 2022): consider the way the Harmony is marketed as "the perfect companion in the palm of your hands", exacerbating pressures on performativity in social reproduction setting unrealistic expectations of "perfection" in companionship and reinforcing a patriarchal domesticating gaze on the female body through the fantasy of possessing the other under one's own command ("in the palm of your hand"). Here the commercialization of the AI humanoid robots materializes the commensurability of AI and natural bodies by offering consumers the physical control over a body that imitates the natural one.

AI humanoid robots crystalise a heterogeneous amount of dead labour in various sectors (care, hospitality, companionship, entertainment, retail) and produce a new division of labour that involve the material logistics and manufacturing processes for building the physical machine, the immaterial and manual labour of high tech professionals and digital factory workers for the designing, programming, coding and training of the AI systems, and finally the prosumeristic labour of customers interacting with the robot.

Re-corporised subjectivities and infrastructures of care and cooperation

The cases of AI humanoid robots we analysed exemplify the emerging transurbanist paradigm whereby transhumanist solutionism affects urban AI imaginary whereby AI technology is presented as a solution framework for urban questions overshadowing natural intelligence on the assumption that they are comparable on a quantitative or qualitative level (Palmini and Curugullo, 2023, p.9). As we saw, this framework not only obscures the natural intelligence that is crystalised in the artificial one as much as the one that is invested in enveloping it, but it also creates competitive pressures for living bodies to negate their fragility reinforcing the reproduction of decorporised subjectivities.

When Sophia is presented as a citizen or Harmony as the perfect companion, artificial intelligence is presented as quantitatively and qualitatively comparable and commensurate with natural intelligence and human bodies. The construction of AI as intelligence, and therefore autonomous, configures an imaginary whose immaterial power accelerates material exploitation: By equating AI's productive capacity with living labor, capital activates new regimes of subjection: the performance of human labor is increasingly regimented by the algorithmic optimization logics embedded in AI systems. The algorithms driving AI's social construction (and its subsequent urbanization) are, fundamentally, algorithms of intensified exploitation of living labor and natural intelligence.

Capital's spatial reconfiguration of exploitation thus depends on the immaterial production of a transurbanist imaginary, wherein AI is mythologized as an enhanced replica of human intelligence. This ideological construction naturalizes the subsumption of life under extractive techno-capitalist operations.

The artificiality of AI does not consist in an optimized re-creation of natural intelligence, but consists in an automation of processes of capture and control of the social interaction of natural intelligences. This allows AI to be defined as a social terrain of material organisation of the relationships between natural intelligences- an open field of possibilities that can contested and played out in different configurations. If capital is a relationship of exploitation between people mediated by things, artificial intelligence presents itself as a material field in which exploitation can intensify or in which relations of exploitation can be overturned. Palmini & Curugullo 2023 remind us that "AIs then should be understood as new effective forms of agency, not intelligences", and their effective performance depends on spatial processes of enveloping (p. 8, 9). This means that AI humanoid robots can be better understood as infrastructural agents as they work as machinic interface that enable data flow, capture and control.

Resistance comes through a demystification of the trans-humanist and trans-urbanist paradigms, and I claim that a critique of AI humanoid robots allows us to radically question the ontology orchestrated by capital. The re-cognition of AI as terrain of struggle calls into the scene new processes of subjectivation that re-corporise urban bodies in the struggle against capital.

On an existential ground, re-corporeisation consists of the aesthetic and psycho-social processes of care and co-presence that are entailed in the

practices of solidarity and in the recognition of exploitation and oppression actualised by common struggles.

Because the living body is characterized by fragility, vulnerability and suffering and death, it can re-corporise and feel itself only by cooperative recognition and feeling of common fragility with another living body. Here, resistance and autonomy can be found in Federici's (2020) and Berardi's (2021, 2023) calls to respectively go beyond the peripheries of the skin and to imagine political and psychotherapeutic strategies that heal suffering subjectivities. The production and reproduction of spaces of care, cooperation and co-presence entail a re-corporisation of subjectivities and a subtraction of living bodies from platform command, control and exploitation. The strategic power of such "*therapolitical*" re-making of the skins lies in the valorisation of vulnerability and fragility, which is exactly what capital aims to transcend and degrade when it presents AI as a better version of the limits of natural intelligence.

On a social ground, re-corporeisation consists of the processes of re-appropriation of technology as a question of organization of the collective body. Instead of automating the market through the algorithms of capital, AI can be employed to organize info-communicative interactions through algorithms of care and cooperation in struggle against capital. This allows to re-direct the geometries of death anxiety onto capitalist relations and away from living bodies, as subjectivities in struggle will project death desire onto capitalist relations rather than onto themselves.

The material re-configuration of urban spaces that has been taking place in the Global Palestine, in the ecological or in the global transfeminist movements and struggles offers an alternative way to envelop technology. This is because the re-cognition of the suffering and deaths of living bodies and the collective material struggle for solidarity and liberation valorise the natural body both as a source of existential meaning (the death and suffering of the other is connected to mine) and as a source of material struggle as material configuration of spaces is operated through the autonomous subjectivation of natural bodies where collective cooperation displaces command.

Finally, the question of vulnerability and mortality is particularly salient in the research concerning human-robot interaction (HRI) (Spatola, 2020). Liberati & Nagataki (2018) problematized the question of othering, embodiment and vulnerability in the context of HRI emphasizing the constitutive role that the other has in the production of the self and in the psycho-geometries of vulnerability-and so of death anxiety. They recognize that the material introduction of social robots has an effect on the way subects shape themselves and argue for the introduction of new vulnerable robots whose fragility is emphasized (p. 339). A line of re-appropriation of AI humanoid robots can be pursued in designing them to imitate the vulnerability and fragility of natural bodies, rather than their performative capabilities, and to serve as infrastructures of the collective natural intelligence, rather than as instances of individual optimized intelligence. AI humanoid robots should be built to represent and reproduce, rather than deny, the fragility of natural bodies, and they should be employed to organise info-communicative flows according to algorithms that are written collectively and autonomously in the struggle against and beyond capital.

Bibliography

Berardi, F. (2021). *The third unconscious: The psychosphere in the viral age*. Verso Books.

Berardi, F. (2023). *Chaos and the automaton*. e-flux.

Cuppini, N., Frapporti, M., Mezzadra, S., & Pirone, M. (2022). Il capitalismo nel tempo delle piattaforme. Infrastrutture digitali, nuovi spazi e soggettività algoritmiche. *Rivista Italiana Di Filosofia Politica*, (2), 103–124. https://doi.org/10.36253/rifp-1686

Dammann, F., Eichenmüller, C., & Glasze, G. (2022). Geographies of "digital governmentality". *Digital Geography and Society*, *3*, 100034. https://doi.org/10.1016/j.diggeo.2022.100034

Federici, S. (2020). *Beyond the peripheries of the skin: Rethinking, remaking, and reclaiming the body in contemporary capitalism*. PM Press.

Liberati, N., & Nagataki, S. (2019). Vulnerability under the gaze of robots: Relations among humans and robots. *AI & Society*, *34* (2), 333–342. https://doi.org/10.1007/s00146-018-0849-1

Cugurullo, F. (2020). Urban artificial intelligence: From automation to autonomy in the smart city. *Frontiers in Sustainable Cities*, *2*. https://doi.org/10.3389/frsc.2020.00038

Massimiliano, N., & Luca, P. (2024). Managing the will: Managerial normativity from the wage society to the platform age. In *Capitalism in the Platform Age*. Springer Studies in Alternative Economics.

Mende, M., Scott, M. L., Van Doorn, J., Grewal, D., & Shanks, I. (2019). Service robots rising: How humanoid robots influence service experiences and elicit compensatory consumer responses. *Journal of Marketing Research*, *56*(4), 535–556. https://doi.org/10.1177/0022243718822827

Noble, S. M., & Mende, M. (2023). The future of artificial intelligence and robotics in the retail and service sector: Sketching the field of consumer-robot-experiences. *Journal of the Academy of Marketing Science*, 51(4), 747–756. https://doi.org/10.1007/s11747-023-00948-0

Oravec, J. A. (2022). Love, sex, and robots: Technological shaping of intimate relationships. In *Good Robot, Bad Robot* (pp. 91–123). Social and Cultural Studies of Robots and AI. Springer International Publishing. https://doi.org/10.1007/978-3-031-14013-6_4

Palmini, O., & Cugurullo, F. (2023). Charting AI urbanism: Conceptual sources and spatial implications of urban artificial intelligence. *Discover Artificial Intelligence 3* (1), 15. https://doi.org/10.1007/s44163-023-00060-w

Parviainen, J., & Coeckelbergh, M. (2020). The political choreography of the Sophia robot: Beyond robot rights and citizenship to political performances for the social robotics market. *AI & Society*, *36*(3), 715–724. https://doi.org/10.1007/s00146-020-01104-w

Pasquinelli, M. (2023). *The eye of the master: A social history of artificial intelligence*.

Sinclair, K. (2022). The feminised robot: Labour and Harawayan afterlives. *In Artificial Intelligence and Its Discontents* (pp. 43–62). Palgrave Macmillan.

Spatola, N. (2020). Would you turn off a robot because it confronts you with your own mortality? In *Companion of the 2020 ACM/IEEE International Conference on Human-Robot Interaction* (pp. 61–68). ACM. *https://doi.org/10.1145/3371382.3380736*

Yang, J., & Chew, E. (2021). A systematic review for service humanoid robotics model in hospitality. *International Journal of Social Robotics*, 13(6), 1397–1410. *https://doi.org/10.1007/s12369-020-00724-y*

RealDoll. (n.d.). *Harmony X*. Retrieved from https://www.realdoll.com/product/harmony-x/

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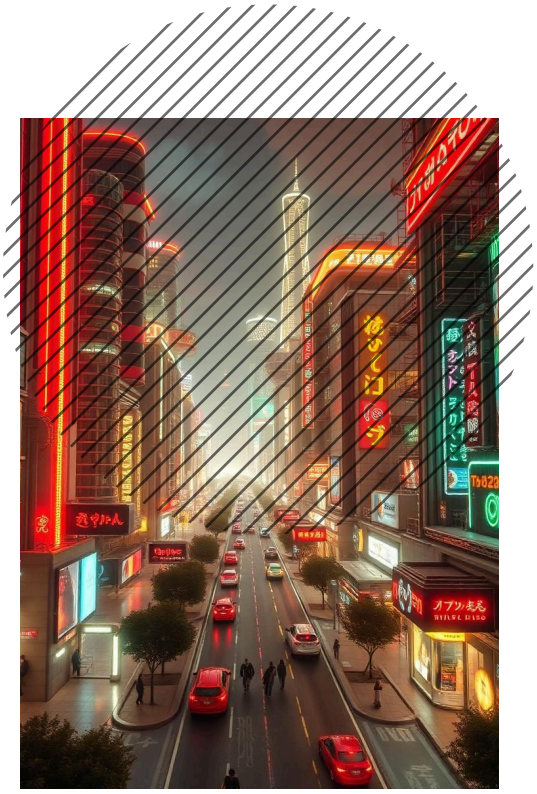
CHAPTER 2



CHAPTER 2

Speculative horizons of automation: who bears the brunt of automation in the food delivery sector?

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Introduction: Speculative Promises of Automation vs. Operational Reality

As I regularly check WhatsApp and Telegram groups for delivery riders in Berlin and Barcelona—two cities central to my fieldwork—I am reminded of the day-to-day challenges riders face: payment glitches, inaccurate routing, shift planning errors, and inadequate support during deliveries. These frustrations are not isolated incidents but are symptomatic of a larger issue: the relentless drive toward digital Taylorism in the platform economy (Altenried, 2022). Whether framed as deliberate platform sabotage (Shapiro, 2023)or glitches in these systems (Leszczynski, 2020), these challenges highlight tensions between the promises of optimization and the lived realities of platform labor.

While these immediate concerns dominate workers' experiences, companies simultaneously propagate a contrasting narrative—one that envisions a future reshaped by automation. Promises of efficiency, sustainability, and reduced labor costs dominate corporate rhetoric, promoting the speculative horizons of automation. These horizons serve as strategic imaginaries, where technologies like artificial intelligence (AI) and autonomous systems are portrayed as transformative solutions, attracting capital and aligning with urban policy agendas.

Such narratives obscure their ideological dimension: the framing of automation as inevitable progress, designed to override historical and social considerations in favor of efficiency and smoothness. Yet, as my fieldwork reveals, the material realities for delivery workers tell a different story—one where speculative promises translate not into emancipation but into intensified exploitation and precarity. As Benanav (2019) notes, automation discourses frequently overpromise and under deliver, leaving a significant gap between these speculative futures and operational realities.

In the food delivery sector, these speculative horizons mask a continued reliance on precarious labor, especially from migrant workers. While conducting fieldwork in Berlin and Barcelona I encountered how automation is discussed not in terms of fully autonomous futures but through its immediate effects—such as digital Taylorism's increasing control over and optimization of labor (Altenried, 2022). Far from achieving the complete automation of last-mile delivery, companies depend heavily on riders while marketing technological advancements as transformative.

This discrepancy becomes evident in the contrasting roles that automation plays in corporate strategies and public narratives. For example, the launches of autonomous vehicle (AV) pilot projects are widely celebrated on social media and company blogs (Bachmann, 2021; Kutay Yarali, 2021; Östberg, 2021) (image 1) but occupy a less prominent role in annual reports, where solid pathways to profitability must be presented to shareholders. This pattern aligns with the "recurring historical gap between the wild promises and the reality of AV development" (Wells, Attoh and Cullen, 2023). Speculative automation thus functions less as a practical solution and more as a narrative tool to attract investment and justify ongoing experimentation.

Overpromising and underdelivering is not a practice unique to platform labor, a subset of the broader digital growth machine (Rosen and Alvarez León, 2022). Rather, it is a hallmark of tech-driven economic processes with global reach. The downturn in stock markets during the summer of 2024 (MCkenna, 2024) exemplifies this dynamic, as AI-driven fluctuations — led by Nvidia — highlighted the widening gap between speculative

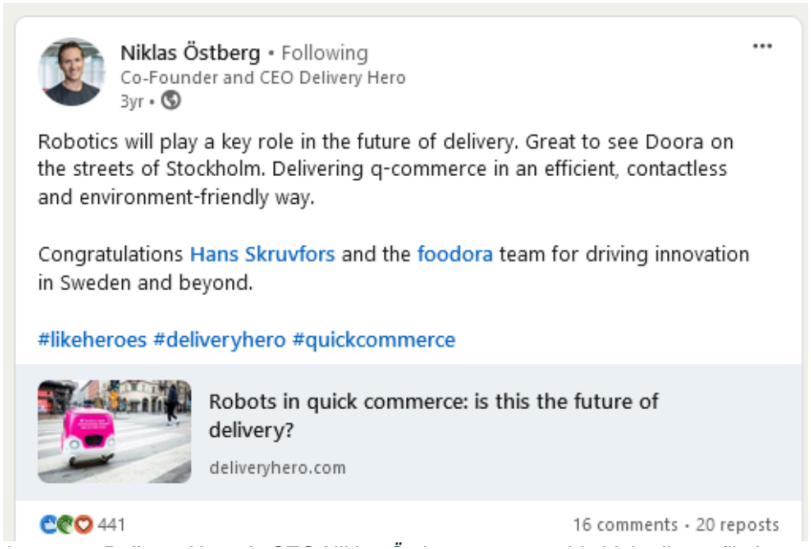


Image 1. *Delivery Heroe's CEO Niklas Östberg states on his Linkedin profile in 2021 "Robotics will play a key role in the future of delivery. Great to see Doora on the streets of Stockholm. Delivering Q-commerce in an efficient, contactless and environment-friendly way."*

promises and operational realities. This so-called revolution, which pledged to render manual labor obsolete, has yet to materialize.

The stock market squabbles over Silicon Valley's latest "hot thing" are not only shaping the availability of capital for funding yet another AI-driven food delivery startup but are also directly affecting the everyday lives of dark store workers, warehouse staff, and delivery riders on a global scale. Companies like Just Eat Takeaway.com and Delivery Hero have, in recent years, heavily promoted automation —from autonomous vehicles (AVs) for deliveries to AI-driven logistics systems—as a near-revolutionary shift. However, while AI has made technological innovation more appealing to investors, these promises often obscure both the human labor underpinning automation and the labor that interacts directly with these technologies. Investments in automation generally operate under the assumption that market dominance will eventually translate into profitability, yet this remains an elusive goal within the platform economy, particularly for businesses still reliant on in-place labor (Cusumano, 2019).

The question is not whether the ideology professed by figures like Peter Thiel is political—this is self-evident—but rather how these technologies (or the narratives surrounding them) are restructuring urban social relations, particularly labor. Economically, these promises hinge on emerging technologies, advocating for efficiency, sustainability, and streamlined processes that, in theory, could lead to profitability. Politically, the rhetoric of automation fosters a vision of society where innovation supersedes historical and social considerations, positioning the city as a space to be optimized rather than lived in. Policies like Madrid's *Ordenanza de Movilidad Sostenible* (2021) epitomize this framing, emphasizing technological experimentation over the rights and well-being of workers. As Wells et al. (Wells, Attoh and Cullen, 2023, p. 112)argue, "as much as they propose certain visions of the city, they work to change a city." Such policies reinforce an ideological commitment to frictionless urban systems, which prioritize convenience for some while marginalizing those who labor within these spaces.

Their transformative potential lies in their capacity for abstraction — a world as smooth and frictionless as a Google Maps layer, designed for convenience and efficiency, where workers are deemed more of an obstacle than an asset, mere pebbles in the shoe of progress.

In the following sections, I explore how the speculative promises of automation intersect with historical and geographical dynamics of labor exploitation, focusing on the persistent reliance on precarious and racialized workers in the platform economy. Through the lens of cases such as Just Eat Takeaway.com and Goggo Network, I demonstrate how automation narratives sustain extractivist practices and intensify worker precarity, while the promised technological transformation remains elusive.

Recycled Promises: Migrant Labor and the Persistent Realities of Automation

David Graeber (2015, p. 65) observes that the spread of information technologies and new ways of organizing transport enabled industrial jobs to be outsourced to regions like East Asia and Latin America, where cheaper labor allowed manufacturers to employ less

technologically advanced production-line techniques than would have been feasible in the Global North. This dynamic allowed the promise of automation to appear at least superficially realized in parts of the Global North, where exploitation abroad underpinned local benefits. These promises, even when partially realized, are embedded in geographies of unequal development and core-periphery extractivist relations. While extractivism remains a global phenomenon, mechanisms within the Global North itself are emerging, tapping into these exploitative dynamics through urban contexts. Here, the exploitation of migratory flows exacerbates the precarious conditions of racialized and migrant platform workers (van Doorn, 2017; Gebrial, 2022; van Doorn, Ferrari and Graham, 2023; Katta *et al.*, 2024).

These workers, whose labor sustains the smooth operation of platforms, bear the brunt of a system that continues to rely on human labor while presenting an illusion of technological advancement (Altenried, 2022). In last-mile delivery and logistics, for example, migrant workers endure disproportionate pressure and risk (Zheng et al., 2019; Tran *et al.*, 2022), as their spatial practices are subjected to the optimization logics of tech companies (Palacios Crisóstomo and Kaufmann, 2024). For users of delivery apps, services appear seamless and almost automatic, masking the intense labor, precarious working conditions, and exploitation that underlie these processes (Tassinari and Maccarrone, 2020; Altenried, 2021; Alyanak *et al.*, 2023).

Workers are not only central to the functioning of these platforms but also bear the brunt of their inefficiencies, frequently engaging in unpaid tasks such as troubleshooting app issues (Pulignano *et al.*, 2022; Qadri and D'Ignazio, 2022), rerouting due to inaccurate mapping, or waiting during uncoordinated batching processes. Riders often describe the psychological toll of balancing unpredictable delivery schedules with algorithmic demands that penalize delays while failing to account for real-world obstacles, such as traffic or poor weather conditions. These dynamics reinforce a system where human labor absorbs the gaps in automation, transforming workers into adaptive buffers for the inefficiencies of supposedly optimized systems. Far from being emancipated by automation, these workers are caught in a paradox: positioned as essential yet increasingly marginalized, they bridge the gap between "old school" logistics and the speculative horizons of a fully automated future — an ideal that remains perpetually out of reach.

Rather than addressing systemic inequalities, automation narratives reinforce them, deepening reliance on cheap, precarious labor while sidelining conversations about workers' rights. As Wells et al. (2023, p. 96)notes, this makes discussions about workers' rights seem "outdated or even irrelevant." It raises critical questions: In what ways are the promises of automation creating a schism between the present and a future that never arrives? And at what cost to those who remain tethered to the most precarious forms of labor?

In the following section, I explore these tensions through two vignettes: one focusing on the annual reports of delivery giant Just Eat Takeaway.com, and the other on media coverage of Goggo Network's autonomous delivery robots in Spain. These documents serve as proxies (Fields, Bissell and Macrorie, 2020;

Palacios Crisóstomo and Kaufmann, 2024) for understanding the role of platforms and automation beyond the opaque walls of corporate secrecy. They reveal how corporate narratives sustain capital accumulation while intensifying worker precarity, exposing the inequalities hidden behind promises of technological progress.

Just Eat Takeaway.com*: Shifting the Burden of Efficiency to Workers*

As surprising as it may seem, some companies in the delivery sector view riders less as key components of the service and more as a significant cost on the balance sheet. This perspective is evident in Takeaway.com's 2016 annual report, where the company primarily relied on participating restaurants to handle deliveries, with the platform serving as a source of orders and facilitating online payments (Takeaway.com, 2016, p. 7). Takeaway also offered its own delivery services through the “Scoober” network in 17 European cities. Despite the higher costs associated with Scoober (Takeaway.com, 2016, p. 82), the company justified this investment by emphasizing the value it added to their marketplace, even though profitability remained elusive (Takeaway.com, 2016, p. 22).

Following the 2020 merger with Just Eat, the portrayal of riders shifted within the company’s strategic framework. Courier costs, including wages, rose sharply—from €37 million in 2019 to €72 million in 2020—while social security and pension costs doubled (Just Eat Takeaway.com, 2020, p. 177).

While the core business model remained largely unchanged, a greater emphasis was placed on Scoober riders, enhancing brand visibility and customer acquisition. By 2023, these costs had grown significantly, with courier wages reaching €223 million and social security at €52 million (Just Eat Takeaway.com, 2023, p. 133).

As annual reports are investor focused, Just Eat Takeaway.com emphasizes how it has optimized its courier network to manage these rising costs. This includes redesigning the Scoober app, improving arrival time algorithms, and using machine learning to predict courier times more effectively (Just Eat Takeaway.com, 2023, p. 28). While these changes are presented as significant advancements, they mainly shift optimization demands onto the riders, increasing pressure to meet tighter delivery windows and handle more orders per trip.

Despite claims that "Artificial Intelligence is central to the next growth phase in our journey"((Just Eat Takeaway.com, 2023, p. 29), these enhancements do little to ease the workload on riders, who remain essential to the delivery network. Instead of reducing the reliance on human labor, these optimizations heighten the strain on riders, embedding them further in a system that demands more under the guise of technological progress. Some optimization strategies have a direct effect on the wellbeing of riders, being heavy orders, overweight backpacks and back pain, a recurrent issue (image 2) directly linked to e.g. the batching of several orders on one rider “they force the riders to take three orders at a time. Because the grocery items are heavy, more than 10 kilos or 15 kilos. So, they are putting a lot of weight on their back, and they are forced to do two or three orders at a time” (Zayd, 2023).

This evolution in the automation narrative reflects a broader industry trend, where employing riders remains a significant

expense, and where riders are paying the price. For example, other companies, such as Deliveroo extensively discusses the financial burden of maintaining a large courier workforce (Deliveroo, 2021, 2023, p. 150), which incentivizes companies to explore automation, not far enough to create a future without riders, but far enough to increase rider's exploitation.

Image 2: *Flyer of a campaign by the Lieferando Workers Collective in Berlin to take the bags out of the rider's back, shared in December 2024. Credits: Lieferando Workers Collective, Berlin.*

Goggo Network: The Fragile Reality Behind Autonomous Delivery Promises

Goggo Network emerged in 2018 with ambitious plans "to provide autonomous, electric, and shared mobility solutions for both people and goods, through the creation of Autonomous Mobility Networks — AMNs —" (Goggo Network, 2024b). In their A-series financing round, Goggo raised €24 million from Axel Springer Digital Ventures and SoftBank (Crunchbase, 2014; Goggo Network, 2024a).

Following Spain's ley rider, which clarified the contractual relationship between riders and delivery platforms, the delivery giant Glovo (Owned by Delivery Hero) signed an agreement with Goggo, after which the companies began requesting permits from Madrid's local government to pilot autonomous delivery robots in the Salamanca neighborhood (Peinado, 2021), taking advantage of a new municipal ordinance facilitating AV implementation (Ayuntamiento de Madrid, 2021). By late 2022, Goggo rolled out autonomous robots in the Alcobendas municipality instead of the Salamanca Neighbourhood, a wealthy Madrid suburb, but without continuing the Glovo partnership. Instead, they partnered with DIA Supermarkets and Telepizza, marking the brief presence of Goggo in Spanish streets.

In early 2023, Goggo expanded its operations to Zaragoza (Lisbona, 2023b)as part of a broader strategy to establish a foothold in multiple Spanish cities (Oxa, 2023). The local government supported this, with Zaragoza's mayor, Jorge Azcón, stating "we want Zaragoza to be a referent, a city where the most advanced technologies can be experimented with, [we want it to be] the most sustainable and respectful with the environment, a vanguard city" (Zaragoza.es, 2022). However, despite the celebrated welcome given to Goggo by the local authorities, public frustration grew just months after implementation, with residents complaining about the robots' performance and the hazards they posed to pedestrians (Ciordia, 2023; Rodríguez Eiris, 2024), experiences corresponding with nuisances in public spaces to pedestrians identified in regards to other last-mile solutions, such as e-scooters (Georgescu,Allahbakhshi and Weibel, 2024;

Image 3: *A restaurant employee loading a delivery robot in Alcobendas, showcasing the persistence reliance on human labor behind the autonomous delivery. Photo credits: Santi Burgos, Diario el País. July 2023*

Hussain *et al*., 2024).

By July 2023, Goggo was still planning its expansion and adjusting its business model, having one of their testbeds in Zaragoza and the other in Alcobendas. During this period, in an interview with El País, co-founder Yasmine Fage stated that the main obstacle for the project to scale up, was the sluggishness of regulation from the public sector "it has to go hand in hand with the local administrations to ensure that there is enough space for robots and people to co-habit [in the public space]"(Santos, 2023). She also mentioned that their initial partnership with DIA supermarkets had failed, because the robots could not carry large grocery orders (Santos, 2023), clashing once again with the operational reality.

Not long after this interview, Goggo's struggles became more apparent. By late 2023, the company withdrew from Zaragoza, leaving little trace on social media, with its last post on X in March 2023 and its final Instagram update in May (Daily Editorial, 2023; Lisbona, 2023a). The company's financial troubles came to light with the initiation of an Expediente de Regulación de Empleo (ERE), a legal procedure which allows companies going through financial distress to enact collective layoffs (Lisbona, 2023a; Rodríguez Eiris, 2024).

The ERE not only marked the end of Goggo's operations in Zaragoza but also underscored the company's continued reliance on human labor. Despite its focus on robotics, Goggo ultimately depended on the workers at its warehouse on Calle de Coimbra No. 2, Zaragoza, to sustain its business.

Conclusion: Automation Narratives and the Ongoing Reinvention of Labor

The introduction of autonomous delivery robots in Alcobendas and Zaragoza in 2022, heralded by the headline "The End of the Riders?" (Higuera, 2021), epitomizes the speculative nature of automation in the food delivery sector. The case of Goggo Network showcases how the early enthusiasm surrounding automation, bolstered by regulatory frameworks such as Madrid's Ordenanza de Movilidad Sostenible (2021) and the support of local policy actors, quickly unraveled when confronted with the operational complexities of labor, regulation, and

technology. What initially seemed feasible during the speculative phase of urban governance and pandemic-driven optimism ultimately failed to materialize under real-world conditions. This trajectory reveals the precarious foundations upon which speculative automation narratives are built.

Despite the failure of Goggo's partnership with Glovo, the pursuit of automation reflects a broader trend in the delivery industry, where companies like Delivery Hero—progressively acquiring Glovo from 15% ownership in 2018 to full control in 2022 (Delivery Hero, 2022)—continue to position automation as a solution to rising labor costs and investor expectations. Yet the promised cost reductions or efficiencies often remain elusive. According to Goggo's co-founder, automation may ultimately cost "the same or a little less" than employing riders (Santos, 2023), calling into question the financial rationale for such ventures. Beyond financial feasibility, this also highlights the enduring importance of human labor, even in industries heavily influenced by automation rhetoric.

Just Eat Takeaway.com's ongoing expansion of its Scoober rider network underscores a different set of contradictions. Why would a company seemingly committed to technological optimization maintain a human courier model? One possibility is that by streamlining tasks and automating select processes, the company seeks to reduce riders' roles to interchangeable parts in a highly optimized system—a "machinic assemblage" (Briziarelli and Armano, 2020). Here, automation serves less as a replacement for workers and more as a way to achieve this machinic assemblage, creating new forms of exploitation rather than alleviating existing burdens.

These cases reveal a deeper contradiction at the heart of automation discourse: while companies publicly champion AI and robotics as solutions to labor inefficiencies, they remain fundamentally dependent on human workers. This dependency is not acknowledged but actively obscured. As Wells, Attoh, and Cullen (2023) aptly note, "Drivers are central, and talk of AVs (and automation) works to mask this fact." Far from heralding a labor-free future, speculative automation narratives often create conditions where labor is intensified, made more precarious, and rendered invisible through promises of innovation.

The collapse of Goggo in Spain, alongside Just Eat Takeaway.com's relentless optimization of its rider network, highlights the fragility of automation as a business model. Goggo's Expediente de Regulación de Empleo (ERE), which led to layoffs across its operations, reflects the persistent reliance on traditional labor practices despite claims of transformative technological change. Similarly, Just Eat Takeaway.com's integration of AI-driven optimization tools has not reduced its dependency on riders but instead intensified performance pressures. These cases reveal how speculative automation narratives often fail to address labor costs or operational realities, instead serving as temporary fixes to sustain investor confidence.

Speculative promises of automation intertwine with ideological and material dimensions to sustain capital accumulation. Narratives of efficiency and progress obscure the labor intensification underpinning these platforms, embedding workers in precarious roles while presenting automation as a pathway to a

labor-free future. This paradox, where technological innovation perpetuates rather than resolves labor exploitation, reshapes urban governance and labor markets, entrenching systemic inequalities. Addressing these issues demands moving beyond speculative technological solutions to confront the structural conditions that enable automation to function as a tool for labor intensification.

What the collapse of speculative automation narratives reveals is not a labor-free future but a reconfiguration of labor itself—intensified, hidden, and perpetually precarious. To move beyond these cycles of exploitation, it is need to focus on practices such as regulating, replicating and resisting (Graham, 2020), which can help to dismantle this exploitative practices embedded in the platform economy and envision a future not dominated by the speculative horizons of automation.

Bibliography

Altenried, M. (2021) 'Mobile workers, contingent labour: Migration, the gig economy and the multiplication of labour', *Environment and Planning A* [Preprint]. Available at: https://doi.org/10.1177/0308518X211054846.

Altenried, M. (2022) *The Digital Factory: The Human Labour of Automation*. 1st edn. Chicago and London: The University of Chicago Press.

Alyanak, O. *et al.* (2023) 'Platform work, exploitation, and migrant worker resistance: Evidence from Berlin and London', *The Economic and Labour Relations Review*, 34(4), pp. 667–688. Available at: https://doi.org/10.1017/elr.2023.34.

Ayuntamiento de Madrid (2021) *Madrid aprueba la Ordenanza de Movilidad Sostenible para compatibilizar la lucha contra la contaminación con el desarrollo económico*, *Actualidad*. Available at: https://www.madrid.es/portales/munimadrid/es/Inicio/Actualidad/Noticias/Madrid-aprueba-la-Ordenanza-de-Movilidad-Sostenible-para-compatibilizar-la-lucha-contra-la-contaminacion-con-el-desarrollo-economico/?vgnextfmt=default&vgnextoid=3f6961cfcafdb710VgnVC.

Bachmann, M. (2021) *Robots in quick commerce: is the future of delivery?*, *Delivery Hero Blog*. Available at: https://www.deliveryhero.com/blog/robots-in-quick-commerce/.

Benanav, A. (2019) 'Automation and the future of work - I', *New Left Review*, Sept/Oct 2(119), pp. 1–38.

Briziarelli, M. and Armano, E. (2020) 'The social production of radical space: Machinic labour struggles against digital spatial abstractions', *Capital and Class*, 44(2), pp. 173–189. Available at: https://doi.org/10.1177/0309816819899414.

Ciordia, P. (2023) 'Los robots repartidores enfadan a los zaragozanos: «Estos cacharros no hacen más que estorbar»', *Ok Diario*, 30 September. Available at: https://okdiario.com/espana/robots-repartidores-enfadan-zaragozanos-estos-cacharros-no-hacen-mas-que-estorbar-11639998.

Crunchbase (2014) *Goggo Network Company Financials*, Crunchbase. Available at: https://www.crunchbase.com/organization/goggo-network/company_financials.

Cusumano, M.A. (2019) '"Platformizing" a bad business does not make it a good business', *Communications of the ACM*, 63(1), pp. 23–25. Available at: https://doi.org/10.1145/3372918.

Daily Editorial (2023) 'Los robots de Goggo dejan de entregar pedidos a los zaragozanos', *Aragon Digital.es*, 11 November, p. na. Available at: https://www.aragondigital.es/articulo/zaragoza/los-robots-de-goggo-dejan-de-entregar-pedidos-a-los-zaragozanos/20231111110320850259.html.

Deliveroo (2021) *Annual report 2021*. London. Available at: https://dpd-12774-s3.s3.eu-west-2.amazonaws.com/assets/9916/4856/5872/Deliveroo_plc_Annual_Report_2021.pdf.

Deliveroo (2023) *Delivering value: annual report 2023*. London. Available at: https://doi.org/10.31399/asm.edfa.2009-3.p046.

Delivery Hero (2022) *Annual report 2022*. Berlin. Available at: https://ir.deliveryhero.com/media/document/d642242f-833c-45ff-b7b1-9c9784cea279/assets/DeliveryHero_Annual Report_2022.pdf.

van Doorn, N. (2017) 'Platform labor: on the gendered and racialized exploitation of low-income service work in the "on-demand" economy', *Information, Communication & Society*, 20(6), pp. 898–914. Available at: https://doi.org/10.1080/1369118X.2017.1294194.

van Doorn, N., Ferrari, F. and Graham, M. (2023) 'Migration and Migrant Labour in the Gig Economy: An Intervention', *Work, Employment and Society*, 37(4), pp. 1099–1111. Available at: https://doi.org/10.1177/09500170221096581.

Fields, D., Bissell, D. and Macrorie, R. (2020) 'Platform methods: studying platform urbanism outside the black box', *Urban Geography*, 41(3), pp. 462–468. Available at: https://doi.org/10.1080/02723638.2020.1730642.

Gebrial, D. (2022) 'Racial platform capitalism: Empire, migration and the making of Uber in London', *Environment and Planning A*, 0(0), pp. 1–25. Available at: https://doi.org/10.1177/0308518X221115439.

Georgescu, A.I., Allahbakhshi, H. and Weibel, R. (2024) 'The impact of microscale street elements on active transport of mobility-restricted individuals: A systematic review', *Journal of Transport & Health*, 38, p. 101842. Available at: https://doi.org/10.1016/J.JTH.2024.101842.

Goggo Network (2024a) *About Goggo Network*, Goggo Network. Available at: https://goggonetwork.mysites.io/about/.

Goggo Network (2024b) *Vision, Goggo Network*. Available at: https://goggonetwork.mysites.io/vision/.

Graeber, D. (2015) *The Utopia or Rules On Technology, Stupidity, and the Secret Joys of Bureaucracy*. 1st edn. Brooklyn, NY: Meville House Publishing.

Graham, M. (2020) 'Regulate, replicate, and resist–the conjunctural geographies of platform urbanism', *Urban Geography*, 41(3), pp. 453–457. Available at: https://doi.org/10.1080/02723638.2020.1717028.

Higuera, A. (2021) '¿El fin de los riders? Glovo repartirá comida a domicilio con robots autónomos a partir de 2022 en Madrid', *20bits*, p. na. Available at: https://www.20minutos.es/tecnologia/moviles-dispositivos/es-el-fin-de-los-riders-glovo-repartira-comida-a-domicilio-con-vehiculos-autonomos-a-partir-de-2022-en-madrid-4925885/.

Hussain, Z. et al. (2024) 'Experimental Investigation of Pedestrians Interacting with E-Scooter Riders on Residential Roads', *Procedia Computer Science*, 251, pp. 303–310. Available at: https://doi.org/10.1016/J.PROCS.2024.11.114.

Just Eat Takeaway.com (2023) *Annual Report 2023*. Amsterdam. Available at: https://s3.eu-central-1.amazonaws.com/takeaway-corporatewebsite-dev/Annual-Report-2023.pdf#page=8.

Just Eat Takeaway.com (2020) *Annual Report 2020*. Amsterdam.

Katta, S. et al. (2024) 'Migration, migrant work(ers) and the gig economy', *Environment and Planning A: Economy and Space*, 56(4), pp. 1102–1112. Available at: https://doi.org/10.1177/0308518X241250168.

Kutay Yarali, A. (2021) 'Introducing our announced 10-minutes autonomous delivery service, alongside Glovo, Madrid Futuro and Goggo Network!', *Linkedin*, p. Online. Available at: https://www.linkedin.com/posts/ali-kutay-yarali-15001332_autonomousdriving-autonomousvehicles-fooddelivery-activity-6876755389854060544-X6dC?utm_source=share&utm_medium=member_desktop (Accessed: 24 August 2024).

Leszczynski, A. (2020) 'Glitchy vignettes of platform urbanism', *Environment and Planning D: Society and Space*, 38(2), pp. 189–208. Available at: https://doi.org/10.1177/0263775819878721.

Lisbona, J. (2023a) 'Los robots de Goggo abandonan Zaragoza ante los problemas financieros de la empresa', *Heraldo*, 11 November, p. na. Available at: https://www.heraldo.es/noticias/aragon/zaragoza/2023/11/11/los-robots-de-goggo-abandonan-zaragoza-ante-los-problemas-financieros-de-la-empresa-1690366.html.

Lisbona, J. (2023b) 'Los robots de Goggo salen a la calle: "Soy Lucas, aquí está su pedido"', *Heraldo*, p. na. Available at: https://www.heraldo.es/noticias/aragon/zaragoza/2023/03/05/los-robots-de-goggo-salen-a-la-calle-zaragoza-soy-lucas-aqui-esta-su-pedido-1635841.html.

MCkenna, G. (2024) '"Magnificent Seven" stocks shed over $600 billion during selloff —Nvidia hit hardest', *Fortune*, 5 August, p. Online. Available at: https://fortune.com/2024/08/05/magnificent-seven-lose-600-billion/.

Östberg, N. (2021) 'Robotics will play a key role in the future of delivery. Great to see Doora on the streets of Stockholm. Delivering q-commerce in an efficient, contactless and environment-friendly way.', *Linkedin*, p. Online. Available at: https://www.linkedin.com/posts/oestberg_robots-in-quick-commerce-is-this-the-future-activity-6794924143335755777-AB0Y?utm_source=share&utm_medium=member_desktop.

Oxa (2023) *Goggo Network and Oxbotica partner to bring autonomous deliveries to Europe*, *Oxa news and insights*. Available at: https://oxa.tech/news-and-insights/goggo-network-and-oxbotica-partner-to-bring-autonomous-deliveries-to-europe/.

Palacios Crisóstomo, N. and Kaufmann, D. (2024) 'STRATEGIES AND TACTICS IN PLATFORM URBANISM: Contested Spatial Production through Quick Delivery Platforms in Berlin and Barcelona', *International Journal of Urban and Regional Research*, 48(5), p. Online first. Available at: https://doi.org/10.1111/1468-2427.13269.

Peinado, F. (2021) 'Glovo pide permiso para ensayar el reparto con robots en el distrito de Salamanca de Madrid', *El país*, 13 December, p. na. Available at: https://elpais.com/espana/madrid/2021-12-13/glovo-pide-permiso-para-repartir-con-robots-en-el-barrio-de-salamanca-de-madrid.html.

Pulignano, V. *et al.* (2022) *Does it Pay to Work? Unpaid Labour in the Platform Economy*. Brussels. Available at: https://doi.org/10.2139/ssrn.4013358.

Qadri, R. and D'Ignazio, C. (2022) 'Seeing like a driver: How workers repair, resist, and reinforce the platform's algorithmic visions', *Big Data and Society*, 9(2), pp. 1–17. Available at: https://doi.org/10.1177/20539517221133780.

Rodríguez Eiris, E. (2024) 'Los robots de reparto no funcionan para Glovo y Uber Eats en España', *Qué*, p. na. Available at: https://www.que.es/2024/06/05/robots-glovo-uber-eats/.

Rosen, J. and Alvarez León, L.F. (2022) 'The Digital Growth Machine: Urban Change and the Ideology of Technology', *Annals of the American Association of Geographers*, 112(8), pp. 2248–2265. Available at: https://doi.org/10.1080/24694452.2022.2052008.

Santos, E. (2023) 'La comida llega sobre cuatro ruedas: así evolucionan los primeros robots de reparto en España', *El País*, p. na. Available at: https://elpais.com/tecnologia/2023-07-11/la-comida-llega-sobre-cuatro-ruedas-asi-evolucionan-los-primeros-robots-de-reparto-en-espana.html.

Shapiro, A. (2023) 'Platform sabotage', *Journal of Cultural Economy*, 16(2), pp. 203–220. Available at: https://doi.org/https://doi.org/10.1080/17530350.2022.2159495.

Takeaway.com (2016) *Annual report 2016*. Amsterdam.

Tassinari, A. and Maccarrone, V. (2020) 'Riders on the Storm: Workplace Solidarity among Gig Economy Couriers in Italy and the UK', *Work, Employment and Society*, 34(1), pp. 35–54. Available at: https://doi.org/10.1177/0950017019862954.

Tran, N.A.T. et al. (2022) 'Health and safety risks faced by delivery riders during the Covid-19 pandemic', *Journal of Transport and Health*, 25(October 2021), p. 101343. Available at: https://doi.org/10.1016/j.jth.2022.101343.

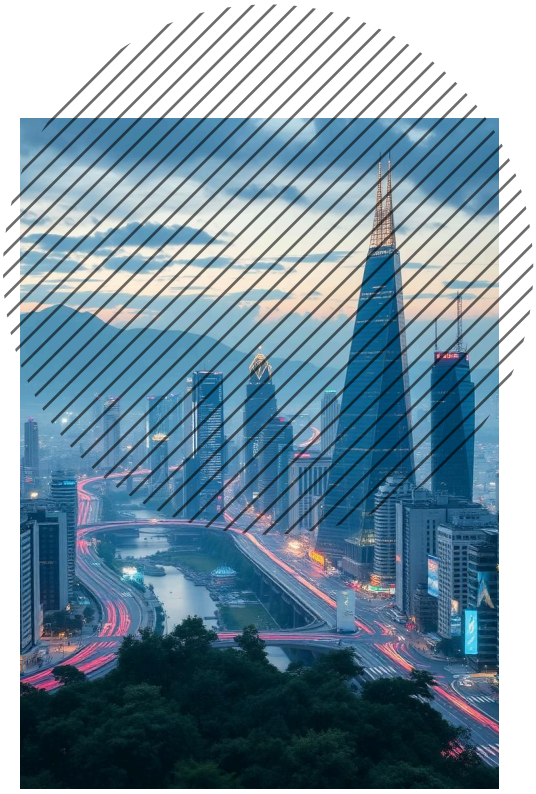
Wells, K.J., Attoh, K. and Cullen, D. (2023) 'Flying Cars and other Urban Legends', in Disrupting D.C. *The Rise of Uber and the Fall of the City*. 1st edn. New Jersey & Oxford: Princeton University Press, pp. 88–113.

Zaragoza.es (2022) *Goggo Network inicia la prueba piloto de los primeros robots autónomos de reparto en Zaragoza*, *Zaragoza.es*. Available at: http://web.archive.org/web/20240421102747/https://www.zaragoza.es/sede/servicio/noticia/312643.

Zayd (2023) Interviewed by N. Palacios Crisóstomo [In-person]. 17 October.

Zheng, Y. *et al.* (2019) 'Crash Involvement and Risky Riding Behaviors among Delivery Riders in China: The Role of Working Conditions', *Transportation Research Record*, 2673(4), pp. 1011–1022. Available at: https://doi.org/10.1177/0361198119841028.

CHAPTER 3



CHAPTER 3

Where We Have Been, Are, and Will Be: On Smartness and Intelligence

An Interview with Orit Halpern and Robert Mitchell

Fabio Iapaolo
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Following the publication of their 2023 book The Smartness Mandate*, Orit Halpern and Robert Mitchell join Fabio Iapaolo for a conversation exploring smartness as an ideology and a set of technologies and practices linking artificial intelligence (AI), finance, urban design, and planetary governance. Moving across its genealogies, present unfoldings, and future trajectories, the discussion reveals smartness as a productive site for both the critique of digital capitalism and the collective imagination of alternative futures.*

FI: It's quite rare for a book title to so powerfully encapsulate its core argument while also conveying the sense of urgency and inevitability surrounding today's technological developments. If you had to briefly define the 'smartness mandate', how would you do so?

OH & RM: The 'smartness mandate' is a historically specific ideology that asserts that increased ubiquitous computing and artificial intelligence (AI) are necessary for the survival of societies. We use the term survival specifically. What makes this a mandate is the assumption that these technologies are necessary and natural. So for example, the idea that without increased investment in AI a country will

not be competitive globally, or that smart cities and big data are necessary to combat the climate crisis. These responses are not always wrong, but they do need to be situated and understood as historically specific ideas concerning economy, society, politics, and technology and not biological and evolutionary imperatives. There are of course other ways to counter climatic, political, and social challenges.

FI: You describe smartness as "the result of this combination of optimization and derivation" (Halpern & Michell, 2023, p. 155). For those who may not have read your book yet, could you elaborate on what you mean by that?

OH & RM: While it's often noted that smart systems and AI are linked to platform capitalism and to venture capital, a lot of media scholarship does not engage finance capital or specifically expand on this relationship. Our interest in the book was to do so, and to make clear links historically and theoretically to financial instrumentation and finance capital with the engineering of smart and AI systems. Therefore, our insistence on understanding how practices of optimization in computing link to financial logics, particularly those of derivation. Derivative pricing equations are a central technology in finance, one that plays a key part in automating human decision making and digitalizing markets since the 1970s.

Optimization is a very commonly used word in engineering. To optimize is to make something 'better', but better how? Whereas 19th and early 20th century ideas of efficiency were grounded in ideas of thermodynamics, and reducing the use of energy and heat loss, contemporary ideas of optimization have no referent in nature. So for example, bitcoin burns energy to make money, i.e. more hashing. One can of course optimize more energy waste, just as one can optimize to reduce energy expenditure. One can, in fact, optimize anything — from weapons systems to consumer participation in platforms, to energy use (or energy waste) — optimization is a relative term. What often seems to define optimization, particularly in relationship to intelligence (smartness), big data, and digital platforms, is the derivation of value. What contemporary smart systems do is get more from an underlying asset. Optimization is thus closely linked to financial forms of derivation.

Smartness is also linked to neo-liberal economic theory on other levels. The inhabitants of a smart city are assumed to become perpetual learners. As the smart city constantly adapts, the people who live in it will also have to adjust. However, the smart city's smartness is not supposed to be imposed upon its urban inhabitants from above; rather, this smartness is supposed to result from the combination of the inhabitants' unique individual perspectives and choices. Smartness presumes that these acts of combination cannot be accomplished by humans alone, but require the assistance of computing processes — and, more specifically, of algorithms which teach the smart city (and its inhabitants) new ways in which to learn. Very much like 'the market' of neoliberal economic theory, smartness optimizes processes by combining multiple perspectives in a way that cannot be achieved by any group of human planners. For some of its advocates, the ability of smartness to automate the combination of an enormous number of individual perspectives makes it possible to imagine that one could perhaps replace politics — that messy realm of self-interest, which

often only seems fully open to a select few — with technological processes that could actually achieve what democracy only promises. Smartness can be understood, and we want to understand it as such, as closely linked to a broader epistemology and ideology of the market.

FI: Your book presents a compelling argument that smartness goes beyond its typical association with urban policy and computation, instead representing a *new form of planetary governance* — an organising principle that connects interlocking processes across multiple geographies and temporalities, from financial speculation and urban design to natural resource extraction. You also fascinatingly show that smartness is far from a recent phenomenon, with its history stretching back decades. What do you see as the key lessons in adopting a planetary perspective on urban automation, the focus of this special issue? And how does understanding the history of smartness offer clearer insights into both our planetary present and future?

OH & RM: Our key concern was in reframing AI and big data infrastructures as epistemologies. In saying so, we wanted readers to understand that these are not isolated technologies, or merely solutions to existing problems. Rather, we want readers to recognize that these technologies are ways of seeing the world, representing it, and making it. AI is part of a broader worldview that encompasses certain attitudes to population, environment, and economy. This is what we mean by planetary governance. That AI and smart systems regulate, adjust, and manage everyday lives through numerous different tactics, whether those of counting, personalization, datafication, learning, or labor.

So for example, personalization and suggestion on streaming services, social networks, or on consumer websites such as Amazon use data from large groups of people to suggest products and services seemingly tailored to individuals. These suggestions may impact what people read, watch, or purchase, and ultimately may shape concepts of the self and the society turning into politics. These processes are titled governmentality.

The reason that we discuss *planetary governmentality* is twofold. The first reason is obvious; such practices are widely dispersed in scale. Many platforms use analogous or similar or even the same technologies all around the globe and depend on planetary or even extra-planetary infrastructures such as satellites.

A second, perhaps more salient reason, is grounded on massive transformations in the relations between nature, culture, and technology that are suggested by terms such as the Anthropocene. What do we mean? AI and ubiquitous computing demand vast amounts of energy, materials (rare earths and many other materials), as well as global-scale supply chains. More significantly smartness (and we would argue AI demands smartness, since the infrastructure for big data collection and the concept of learning at scale predates and makes possible AI systems) demands a new concept of environment. Smartness is an ideology and a set of technologies and practices that exceed digital machines. This includes historically specific ideas of the environment itself as a medium for design and technological intervention. For example, the idea of life itself as an infrastructure for data collection - using organisms as managerial technologies such as wetlands against sea level rise around cities, or using algae, plankton, and

trees as biosensors to collect data about climate changes - are some examples. More broadly smart systems predicate themselves on ideas of networked intelligence that integrate humans and machines intimately and as part of single systems imagined as capable of adaptation, change, or even evolution (witness the salience and emergence of ideologies of singularity, transhumanism, and other such concepts). The term *planetarity* describes this combination of governmentality with changing ideas of the environment, technology, and the 'human'.

FI: The editors of this special issue call for broadening perspectives on automation, urging approaches that move beyond "either the demystification of its ideology or the endorsement of its technocracy". Your book, I believe, does this exceptionally well. For example, you trace how the notion of *resilience* — central to smartness and often invoked in opposition to neoliberal, technocratic approaches to urban governance — actually originates from the work of neoliberal economists like Hayek. You also consistently maintain an ambivalent stance toward smartness, showing how it not only upholds a socio-economic status quo predicated on profitability, exploitation, and extraction, but also harbors the potential for meaningful positive change. The issue, perhaps, lies less in smartness itself and more in its co-optation by digital capitalism. Rather than rejecting it outright, how can smartness, and resilience, be mobilised to engineer more socially and environmentally just societies?

OH & RM: This is a difficult and long question. But a brief answer is that of course many concepts forwarded by smartness rethink, revise, and challenge ideas of the human. As Donna Haraway (1985) has stated in the *Cyborg Manifesto*, "I would rather be a cyborg than a goddess" (p. 101). Any other stance is reactionary and fantasizes some time we could return to before smart phones and AI. This reactionary stance is one quite common in the alt-Right, and even often in other extremist politics.

Rather, we must take the opportunity that artificiality and smartness offer in opening up the idea of what is or is not intelligent (so including new protections and forms of humanity to those not considered human before and to more than human forms of life), as well as to take up the opportunity that recognizing that environments and 'nature' are themselves humanly produced and engineered, and therefore that we can begin applying notions of responsibility to who and which organizations are doing this engineering. These forms of accounting may open opportunities for political and ethical action in bringing organizations such as corporations to account for their impacts on humans and the environment.

FI: From Hayek's theory of markets and Rosenblatt's Perceptron to Negroponte's computer-aided architecture and the Black-Scholes option pricing model, a recurring idea in your book is that smartness and learning emerge at the level of populations, rather than individual agents. You also show how each of these examples - whether involving human populations or neural network nodes - assumes a distinct understanding of the human subject. In its contemporary iterations, how does smartness redefine what it means to be human, as well as the forms of political agency associated with it?

OH & RM: This question begs that one read

the book. Each of your examples has a different notion of decision making, agency, sovereignty, learning, and often freedom that might be related to what we term the 'human'. At a very broad level the redefinition of the human might be said to engage the question of 'omniscience'. If there is a key element to the redefinition of the human, it lies in the concept of learning, and the idea that now both humans and machines are perpetual learners, because nothing and no one ever has full knowledge of the world or the future. Learning is not however pedagogy or imagination, and this is a serious question for long discussion.

To summarize this idea, while it is easy (and correct) to point out that the language of smartness already seeks to set the terms of engagement by implying that the alternative to smartness is stupidity — and who, after all, would want to live in a dumb city? — the real opposite of smartness is not stupidity, but omniscience. The language of smartness suggests that we can either aspire to omniscience — which, if attainable, would indeed allow us to take all contingencies into account beforehand — or we can recognize that omniscience is impossible for mere mortals, and instead aim for smartness, which means perpetual learning in the light of changing circumstances. Thus, despite its heavy reliance on cutting-edge technologies, smartness can be opposed to technocratic visions of social change. Smartness contests, for example, the technocratic distinction between experts and non-experts in favor of the claim that everyone has knowledge to contribute. In this sense, it is also an appeal to include previously marginalized voices, and it demands that everyone, including those who are privileged, become perpetual learners. From this perspective, it is hard to object to the basic idea of smartness, even if some of its current implementations may be considered problematic.

The importance of smartness — as an ideology, as an ever-changing set of technologies and techniques, but also as a possible focal point for hope — becomes especially evident when viewed from the perspective of our current ecological crisis. This crisis includes global warming, the increasing dominance of one-crop agriculture, the global spread of microplastics, and a plethora of other global dangers. It seems clear to us that humanity has arrived at this point as a result of capitalism, and it seems equally evident that capitalism itself cannot fix this problem, no matter how many innovative new forms of market its advocates may come up with (e.g., carbon offset markets; new forms of insurance for endangered coastal areas; etc.). However, precisely because it is not identical to neoliberalism, smartness retains its potential within this context. For example, the concept and principles of smartness enabled Suzanne Simard's (TED, 2017) innovative work in botany on the networked 'intelligence' of forests, which in turn has the potential to help us rethink the roles of technology in current efforts to make cities and other processes smart. Another helpful contribution is Winona LaDuke and Deborah Cowen's (2020) notion of "alimentary infrastructure" as it shifts the understanding of smart energy infrastructures away from the market-based principles of contemporary smart electrical grids and towards indigenous calls for environmental custodianship and sovereignty.

FI: This emphasis on population over

individual agents also points to a shift toward a relational understanding of intelligence, and by extension, AI, as a distributed and networked property. What is your take on the lasting framing — and preoccupation — with AI as autonomous technologies?

OH & RM: One could argue that AI has a central dichotomy defining the technology — between omniscience and the idea of 'world models' and Artificial General Intelligence and the reality of the technology as dependent on training from populations outside of itself. The fantasy of a fully autonomous AI separated from the network obviously preoccupies many roboticists and the military and other organizations, which compete with the ideal of platforms and social networks.

The disparity between individual sovereign embodiments of technology versus environmentally structured networks fuels a lot of research and desire. So we understand autonomy as a 'frontier' that drives technological developments even if it's never fully achievable. We also understand the dual fantasies and impossibilities of sovereignty and autonomy versus planetarity and networks as underpinning contemporary politics. Reactionary forces often rally around mythic imaginaries of freedom that call on dreams of autonomy but, ironically, only envision this freedom as achievable through fundamentally non-democratic and non-individualist logics and ideologies such as the neoliberal market and venture capital, or through recourse to divine, not human, will. All these ideologies are at cross-purposes with ideas of autonomy and individual sovereignty. But this is a longer conversation involving religion, economy, and technology that the scope of this interview will not permit.

FI: I've heard some people say your book isn't the easiest read. While that might be true in some ways, it's not because the writing is somewhat elusive. It seems more that the way you develop your arguments requires readers to have some prior knowledge, or at least curiosity, about concepts and ideas from disciplines normally kept apart, such as finance, computer science, evolutionary biology, neuroscience, architecture, and political theory. Why is it important for a critique of smart technology to adopt such an interdisciplinary lens, and what do you think it adds to the conversation?

OH & RM: This is a basic question about how to generate new concepts, or to paraphrase Deleuze (1968/1994), "images of thought". Any account that challenges what readers think they know or already know is bound to be difficult to read by definition. If you need to engage a scientific field or discipline you don't have training in, it's hard. In fact, thinking is hard.

We would insist that it is the work of the humanities to be difficult. Otherwise, we are just telling people what they think they already know or have already accepted. Any challenge to norms, histories, and imaginaries is difficult. But simplistic and reductive accounts of the world as comprised of bad or good technologies will never help us do anything but repeat the present, because it accepts the terms of the present.

Our job is to foster diversity and democracy with and through technology. This means finding ways to cultivate diverse approaches, different types of technology, and most important multiple perspectives, narratives, and ideas for the future of democracy and society in plural. Our job is to refrain from simply reacting to

right-wing groups and cultivate ideas.
This is always 'hard' in that it demands new frameworks and new forms of literacy and literature. We are not even sure we succeeded in this book, but we tried!

All civil rights and progressive movements have long known that they must foster ideas and political imaginaries so that what is currently politically impossible will one day be politically inevitable. That is precisely the work of critical research. To cultivate ideas, to create new narratives about our past and future, to foster the hope that systems can change, and to develop alternative ideas, such that when the opportunity for change emerges — whether through crisis or social change — there is a foundation to build new worlds in plural.

Bibliography

Deleuze, G. (1994). *Difference and Repetition* (P. Patton, Trans.). New York: Columbia University Press. (Original work published 1968).

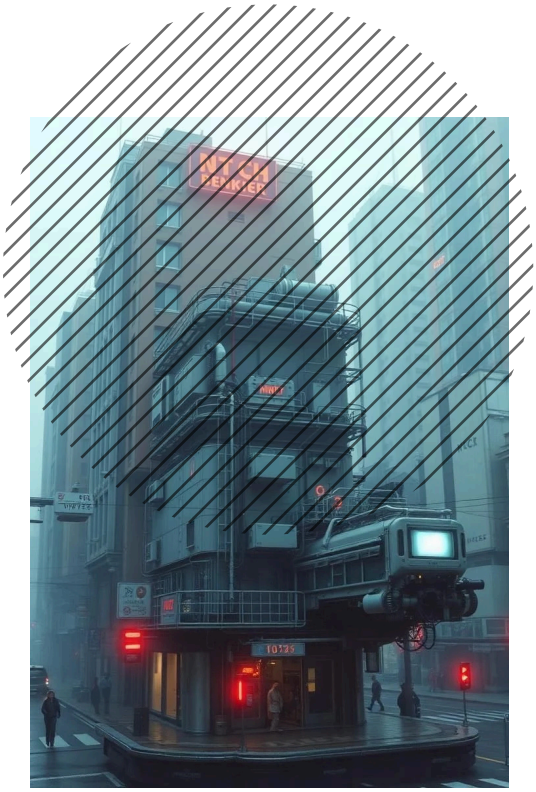
Halpern, O., & Mitchell, R. (2023). *The Smartness Mandate*. Cambridge: Mit Press.

Haraway, D. (1985). Manifesto for cyborgs: Science, Technology, and Socialist Feminism in the 1980s. *Socialist Review*, 80: 65–108.

LaDuke, W. & Cohen, D. (2020). Beyond Wiindigo Infrastructure. *South Atlantic Quarterly*, 119(2): 243–268.

TED (2017, February 2). Nature's Internet: *How Trees Talk to Each Other in a Healthy Forest* | Suzanne Simard [Video]. YouTube: *https://www.youtube.com/watch?v=breDQgrkikM&ab_channel=TEDxTalks*

CHAPTER 4



CHAPTER 4

The Black Archives of Automation. Labor, Technology and Space aboard an Atlantic Slave Vessel

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Introduction

Over the last decade, the global economy has been significantly shaped by the development of automation technologies and infrastructures (Mezzadra & Neilson, 2024). In times where a widespread urban condition insists unevenly on the entire planet, the integration of digital artefacts into existing capital shifts brought to a "digital revolution" whose consequences are scattered across a geography of uneven urban development (Huang & Huang, 2024).

In this context, while new questions arise to understand the future of technology, labour and space, genealogy can be a powerful method to enable a critical view for contemporary urban theory based on the articulation of colonial and postcolonial lineages of knowledge (Cardoso, 2020; Schmidt, 2018; Vegliò, 2021).

What is automation? Where does it come from? How will automation shape labor? To answer these questions, I first recall the Marxist and Operaist literature to see how, on the opposite, the logics, the geographies and aesthetics of the current automation are rather shaped between the accumulation of *valorizing information* generated with the division of living labor and the workers struggles for their liberation (Alquati 1963, Dyer-

Witheford, 1994).

Moving from Marxist labor theory, I refer to a *metric theory of automation* (Pasquinelli, 2015; 2023) according to which "techniques that are used to measure labour suggest the design of technologies of automation once the division of labour reaches a mature stage of development" (Pasquinelli 2023, 243). Then, taking the concepts of *abstract labor* by Hegel and of the *abstract machine* by Deleuze and Guattari (1980) I define how, with a double act of translation (Pasquinelli, 2023), automation technologies learn from an *environment* of collective intelligence.

According to this theoretical framework I thus follow the voyage of a slave ship, the 'Marie Seraphique' from Marseille to Luango to understand the logics, geographies, and aesthetics of earlier technologies of automation in the Atlantic trade.

By analyzing three archives of a slave vessel (a space diagram, a time diagram, a port system) I explore how behind the history of the European industrial revolution, slave ships can be framed as earlier machines set to enable the abstraction of labor value through the production of urban space. Thus, archives of trade value circulation are assumed as privileged analytical tools for a Black Atlantic archeology of urban automation.

The production sites of the Caribbean sugar mills and of the European industry have already been explored as antecedents of factory discipline, machine intelligence and earlier technical automation (Fiori, 2020; Ongweso JR, 2024; Whittaker, 2023). Moving from oceanic spaces of value circulation, the article shares an analytical framework toward an archeology of urban automation that can be developed on earlier logics, geographies, and aesthetics forged in the struggles between the slave trade 'eye of the master' and the slave rebellions of the Black Atlantic.

1. *On labour, machines, and automation: a metric theory*

According to Marx, machines serve as instruments to occupy and replace prior divisions of labor — a concept first articulated by Babbage's Principle. Quoted by Marx in The Poverty of Philosophy, Babbage's Principle states that "when, by the division of labor, each particular operation has been simplified to the use of a single instrument, the linking up of all these instruments, set in motion by a single engine, constitutes a machine" (Babbage, 1832, quoted by Marx, 1847). This principle defines machines as a form of fixed capital, or "dead labor," whose design derives from the information generated by the division of living labor (the workforce). This division segments labor into mental and mechanical operations, organized "with the same economy of time" (Babbage, 1832). As Andrew Ure, whom Marx called "the Pindar of the automatic factory," observed, the industrial apparatus thus emerges as "a vast automaton, composed of various mechanical and intellectual organs" — a definition that has been identified as foundational to Babbage's computing machines.

But can this definition be extended beyond industrial machines? To answer this question, it is crucial to see at the relationship between time, labor, and automation technologies.

Babbage's Principle reflects a form of work organization that consents the measurement and purchase of the exact quantity of labor required for production. According to Pasquinelli, this perspective

allows us to understand automation as a logic that extends beyond the analysis of its physical artifacts. Pasquinelli thus proposes a "metric theory of automation," arguing that "once the division of labor reaches a mature stage of development," it is not automation itself that shapes labor but the "techniques to measure labor that shape the design of automation technologies" (Pasquinelli, 2023, 243).

In this context, machines are not autonomous agents, but, being the product of class struggles, they are shaped to be 'the most powerful weapon for suppressing strikes' (Marx, 1967, 562). Since it is not capital per se, but labour struggles that act as a primary actor in capitalism's technological advancements (Panzieri 1961; Tronti 1966), information produced by workers' knowledge and monitored by the *master* is the source of automation technologies.

This reversal of perspective explains how the technological change is not a neutral progress, but it expresses the capital's necessity to always develop new organizational forms to include workforce into production processes by controlling their unrest and refusal to cooperate with capital (Tronti, 1962).

In particular, as informational and industrial machines are designed to foster the workers cooperation in production, automation perpetuates the authoritarian structure of the factory according to the management's ability to gather *information* on the workers' knowledge – their *socialized intelligence* upon acts of refusal of labour (Tronti, 1966).

Automation technologies origin from here, where the monopoly over such *knowledge* is set by the master to "control of each step of the labour process and its mode of execution" (Panzieri, 1961; 1967; Braverman, 1974, 82). In fact, although Braverman and Panzieri' studies on the so-called 'incorporation processes' are a classic focus on Taylorist production in the 70s, their works are still crucial to grasp major processes in contemporary automation. In his study of contemporary warehouses, Alessandro Delfanti described how Amazon power is established upon a monopoly over the algorithmic control of workers' knowledge in fulfillment centres. To the author, its power relies on the apparatus of capture that feeds what he called a *machinic dispossession*: the translation of the workers activity into data by central software systems.

The informatic –– once called the bureaucratic, now the digital or cybernetic –– apparatus of the factory grows thanks to the forced contribution of workers' socialized intelligence (Alquati, 1963), but how the workers' knowledge becomes information?

Delfanti moves from Alquati's theory of *valorising information* by which it is calculation that makes it possible to *translate knowledge* into *information*, information into numbers, and numbers into *value*.

Echoing Babbage principle, automation thus emerges as an act of double translation, as stated by Pasquinelli (2023), that fulfills the transformation of the knowledge of the general intellect (the workers socialized intelligence to cooperate with and refuse labour) into constant capital, that is, with the words of Deleuze and Guattari, the transformation of a surplus value of code (knowledge) into a surplus value of flow (information) (1972, 232).

Drawing upon Marx's Groundisse notion of abstraction, Deleuze and Guattari developed the concept of the so-called

abstract machine (1980). The concept has been pivotal to explain the algorithms capacity to measure and turn living labour into *abstract labour*: a form of 'intrinsic' or 'absolute' value whose 'immanent' measure is labour time.

Moving from the literature on the machinic assemblage, this last concept has proved to be relevant both to extend the *metric theory of automation* to earlier processes of labour control and to foreground contemporary urban theory by "thinking space as a relationally overdetermined plenitude (Brenner et al., 2011, 237).

Following this theoretical framework, the article analyses three documents from the Atlantic slave trade to see how before and behind the European industrial revolution, the slave ships between the XVI and the XIV century developed earlier technologies of automation to foster the reproduction of forced (slave) and waged (crew) labour. Taking into account the primacy of workers' unruliness for the development of machines, I see how slave ship technologies — defined in critical media theory as *logistical medias* (Peters, 2021; Rossiter, 2016) — were developed to learn from and exhaust the slaves socialized intelligence to cooperate and refuse forced labour.

The article follows the theoretical suggestion by Claudio Napoleoni (1972) and Riccardo Bellofiore (2016), that is to look at *circulation*, more than *production* sites, to look at how technologies rise from the capture of the abstract labour. As abstract labour is *immanent* in the moment of capital production and *manifest* in the moment of its circulation (ivi), I look at earlier technologies of automation in the analysis of colonial port systems, slave warehouses and slave ships as they represent *abstract machines* for the reproduction of labour in the Black Atlantic.

Moving from the mentioned theoretical framework, I analyse how, in the Atlantic trade, the slaves socialized knowledge for the refusal of forced labour gave the origins to what have later been defined as the logics and the aesthetics of automation (Pasquinelli, 2023; Neilson e Rossiter, 2019).

Therefore, as the slave trade routes still define the circulatory infrastructures at the heart of the 'digital revolution' (in the form of shipping routes and internet optics cables), the article shares an archaeology for a history of the capitalist production of the space that origins from the Black Atlantic of the global system. In times of planetary urbanization, the Black Atlantic *archives of automation* express how the *urbanization of sea* (Couling, 2020) is central, rather than 'peripheral', for an 'alternative genealogy of planetary urbanization' (Veglio`, 2021).

2. *Diagrams of space. The shipbuilding of the Marie-Séraphique*

In 300 years, between the second half of the XV and the second half of the XIX century, "the kidnapping, registration and forced transportation of twelve millions of people has been a project so enormous, it reinvented, among the other things, ancient military and commercial logistics" (Zieger, 2021, 35; Harney and Moten, 2016). While colonial production sites have been recently acknowledged as antecedents of industrial "dark satanic mills" in the continent — see, for example, "The Plantation Machine" by Burnard and Garrigus (2016), or "The Sugar Machine" by Crowley (2016) —, the deep ocean and its infrastructures for the circulation of global

value (slave ships, ports, and warehouses) are still underrepresented as critical sites for the development of systems of automation. Nevertheless, it was precisely in this context that the commercial and military discipline of logistics — whose Greek etymology "λογιστική" means "art of computation," — developed as the *fantasy to translate* the violence against black people into what has been defined a deadly art of *calculation* (Harney and Moten, 2016).

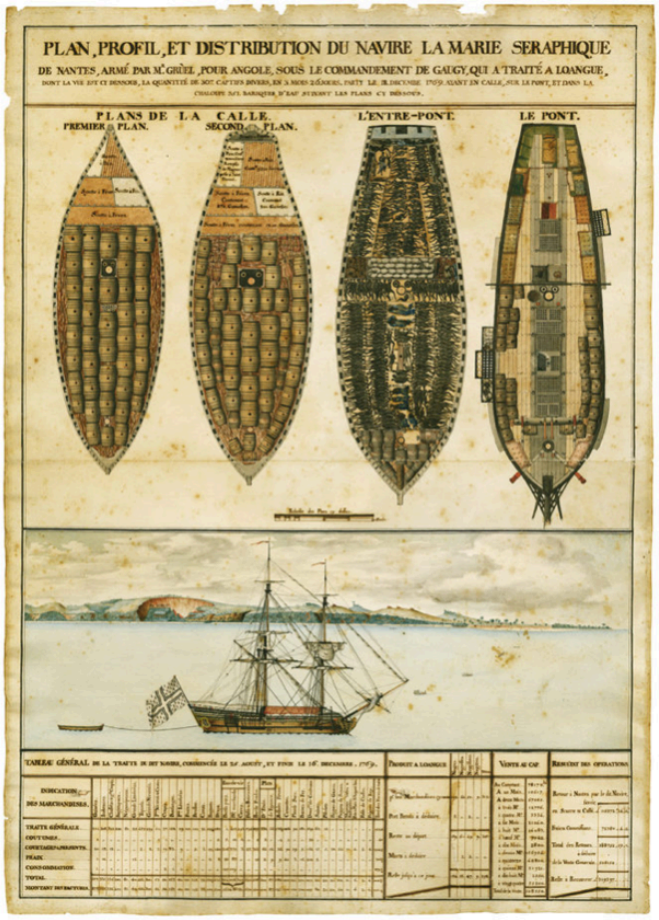
Looking at slave trade archives we can see how the ephemeral chimera of slave labor control let the origins to a set of operations of calculability that were recorded into shipping lists, bills of lading, ships' logs, letters, plantation logs and slavery diagrams (Young, 2021).

In critical media theory, these documents are framed as *logistical medias* (Peters, 2021) and analyzed as predecessors of contemporary software and algorithms that today 'move cargo, people, and information around the world' (Zieger 2021; Young, 2021; Munn, 2020).

This section takes a live painted slave ship diagram to underlie how the shipbuilding of slave vessels was set, on one hand, to learn from and forbid slave cooperation in the form of active and passive acts of resistance to forced labor while consenting, on the other, the reproduction of their *predicted* labor value.

The diagram of the Nantes ship Marie-Séraphique (ID 30910 in Slavevoyages.org), emerged in 2005, shows 307 enslaved people (189 men, 60 women, 49 boys, and 9 girls) imprisoned in a vessel from Loango to Saint Domingue in 1769/70 (Fig. 1). Unlike the supine "clones" of other diagrams written for parliamentary debates on slave regulation-, the slaves in the Marie Séraphique differ in height,

Image 1. *Tween deck of the ship La Marie-Séraphique. © Château des ducs de Bretagne – Musée d'histoire de Nantes, Alain Guillard.*



build, and appearance as they were live painted by one of the officers on board (a woman with a baby at her breast, "seven captives wrapped in blue cloths lie in agony" (Eltis and Radburn, 2019, 548).

Moving from a metric theory of automation, the archives of the Marie-Séraphique are central to understand the inner logics of a slave ship as earlier logics of automation. With two masts instead of three to increase speed and save costs, the vessel of 1,637 square feet, was specifically converted from a goods carrier into a labor carrier.

In particular, as slave revolts were the nightmare of the slave logistics, the space diagrams of slave vessels as the Marie

Seraphique were specifically designed to prevent both passive (as hunger strikes, or suicides) and active resistance by the hold (slaves) and the deck (the crew).

To host an average of 300 enslaved people incarcerated for 8-12 weeks, vessels as the Marie-Séraphique were built with a lower deck beneath the main deck, air ports carved out of the hull to led the cargo breathe, and nettings on the ship's rails to prevent that "slaves souls could go home to Guinea" jumping overboard in acts of suicide (Rediker, 2007, 145).

In the spatial diagram of a slave ship, captives were positioned lying on their right side — a posture considered "preferable for the action of the heart," as noted by a nineteenth-century sailor (Eltis and Radburn, 2019, 548). Men and women, chained together (the women, put close to the captain, were unchained only if they were in minority), were segregated into two rooms designed to "cram as many slaves as possible between decks," exploiting every available space to save costs, let slaves breathe, and prevent insurrection (ivi).

The hold diagram reveals a fence, known as a *barricado*, which was constructed midship to allow the crew to retreat behind it during feeding — one of the most perilous moments in the ship's routine. This design enabled the crew to "shoot down onto the bodies of the insurgents" in the event of an uprising (ivi, 159).

The *barricado*, first developed in the Portuguese trade, became a global standard in slave shipbuilding. It served a dual purpose: reproducing the value of slaves and consolidating the labor composition aboard within forced and waged labor. More than a physical barrier; it was a dynamic technology designed to enhance the value of the cargo by suppressing the social cooperation necessary for resistance. For instance, instructions from the "Oeconomy of a Slave Ship" advised that "just three of the crew were before the barricado at any one time, otherwise the men slaves might seize half the crew on the sudden, and soon become *masters of the vessel*" (Smeathman, 1807, in Coleman, 2007, 141–142). Despite these measures, slave revolts occurred on average once every ten voyages, and the system was persistently undermined by what historians have termed "a 400-year hunger strike" (Rediker, 2007, 134).

Equipped with technologies like the *barricado* and the *speculum oris* — a tool used to force-feed hunger strikers — slave ships embodied Marx's definition of industrial machines as "the most powerful weapon for suppressing strikes" (Marx, 1867: 562).

A focus on the slaves' resistances helps understanding the logics behind the development of shipbuilding technologies as these were not merely industrial artefacts, but earlier logics of automation. In fact, to Neilson and Rossiter, what distinguishes automated systems from mechanized ones is the capacity to *adapt* to an "environment" of socialized intelligence — a *constitutive outside* — "according to the theatre of failure" of their operations (2019, 201).

What was the *environment* aboard?

In the ship, "when someone refused to eat, everyone understood what this meant" (ibid). As acts of active and passive resistance were the main unifying language of the enslaved — who had different linguistic backgrounds — these were also acts of communication, cooperation and revolt between the hold (the slaves) and the deck (the crew). The notion of environment — that presupposes

a learning process and a dynamic configuration between the parts –– particularly fits how, quoting Marx, workers "need both time and experience to *learn* how to distinguish between machinery and its employment by capital, and therefore to transfer their attacks from the material instruments of production to the form of society which use those instruments' (Marx, 1867: 554). Similarly, in the Atlantic trade it was the increasing standardization and intensity of work routine at the deck of slave ships that allowed, once understood by the hold, joint revolts and mutinies between forced and waged workforce. Once understood that slave ships were not just floating prisons, but *machines* shaped on the capital necessity to secure labour exploitation, the mutinies, –– see for example the one of the *Zant* and the *Gambia Castle* in 1721, renamed *Delivery "Liberation"* were acts for the disruption of the inner *logics* and *aesthetics* of the whole Atlantic value circulation.

As vessels evolved into maritime industries marked by the first labor strikes — etymologically rooted in the "strike" of vessels sails in 1768 (Rediker, 1987, 189) —"the deck of pirate ships became the primary locus of *black power* in the 18th-century white world" (Kinkor, 2001, 108).

In response, shipmasters developed both despotic and subtle forms of control, including the concept of race. According to Linebaugh and Rediker (1990, 42), at African docks, where enslaved people and crew members shared similar living conditions, the two groups were reclassified into distinct categories to prevent joint revolts. Enslaved individuals from diverse ethnic groups were collectively labelled "negros," forming a single "negro race," while multi-ethnic crews, including those of African descent, were uniformly termed "whites" — to Rediker this division was not based on the skin colour but on the "control over technology", namely the ship (ibid.).

In the Atlantic trade, the concept of race developed in parallel with the one of waged labour. These were both turned into technologies to translate the *despotic* violence (see the use of the speculum oris for slaves and of the *forced conscription* for the mariners) into an episteme to foster the division between forced and waged labour into the organic composition of capital.

As a result, as long as slaves and crews transferred their attacks from the machine (the vessel) to what Marx called 'the ideological apparatus which regulate production relations' (ivi), the shipmasters used race to translate an earlier form of 'factory despotism' –– typical of industrial labour — into a labour command written into 'cultural and political forces within and beyond the factory walls' (cfr. Delfanti, 2021; Burawoy, 1979).

With this shift, the study of the slave ship echoes the 'augmented despotism' in contemporary logistics, confirming the Conway' principle (1968, 31) through which the design of automatic systems segments the workforce by mirroring "the relations of communication between the parts of the organization that contributed to it".

Moving from the study of the slave ship internal communication — what Harney and Moten called "the undercommons" (2013) — we can acknowledge how the convergence between soft and despotic commands on labour — "the two complementary strategies deployed by capital to subdue the workforce" (Delfanti, 2021, 44) — shaped earlier logics and aesthetics of automation. In fact,

confronting joint mutinies by translating the inner communication of the ship into a racial language, the masters of the slave vessels shaped what in critical media studies has recently been defined as the 'logistical episteme' (Rossiter, 2025) through which the *aesthetics of automation* assert "who gets to speak and who remains silent" (Neilson and Rossiter, 2019).

As long as joint revolts were undefeatable, we see, in the next section, how once at the slave docks, the acts of communication at the hold and the deck were monitored and translated into a system of *valorizing information* for the prediction, control and reproduction of the slaves labor value through the production of space. I assert that the monopoly of this knowledge turned ports, warehouses, and slave ships into 'informatic systems' for the circulation and reproduction of *abstract labor*.

3. *The prediction of time. Slaves inbound in Loango*

What is the relationship between the control of slave labour and the production of space?

While an international literature has explored the interconnections between the geography of contemporary submarine internet cables and the colonial telegraphic network (Starosielski, 2015), few studies analysed the role of the slave trade rebellions in the process (Mwema, & Birhane, 2024).

In this context it is important to unknowledge that, as for the vessel technologies, the slave trade circuits were shaped according to the *prediction* of joint revolts "between the hold and the deck" –– see, the shift, in 1598, of the Spanish Empire Atlantic-Pacific trade chokepoint from Nombre de Dios to Portobelo, which brought Panama to be a contemporary critical corridor (Ducoin, 2000, 82; Ngoumve, 2002).

This section sees the development of diagrams of time that set the *inbound* of slave ships in Loango: a "developed urban port" where slave traders of the eighteen century would "meet a fine-tuned infrastructure" (Gregg & Ruderman, 2021). Here, surgeons, cartographers and scientists developed a an "organized system" (ibid.) of slave warehouses coordinated upon *inbound times* set on the surveillance, the learning and the prediction of slave revolts.

"The success of slave trade depends very much on the good procedures, skills and measures of the surgeon" which, "if put in place to prevent diseases" "have a more certain result rather than those which are used to heal the sick" (Gallandat, 1769, 23). In *Necessary Instructions for Slave Trade*, David Henri Gallandat, a Swiss slave surgeon teaches how to distinguish and report slaves' emotions at the African shores in terms of standardized codes of prediction: "*It is therefore not surprising that such a slave, when he finds himself on board to be sold, and to say his last farewell to his land, that he is sometimes seized with violent emotion. This however is more common among the women than with the men, due to reasons known to all physicians and surgeons, and therefore unnecessary to report here*." (ivi, 15)

As slaves' bodies were coded into standard vessel units of space, emotions were surveilled to fill diagrams of time to set the vessel speed according to the fear to "loose the cargo".

The Marie-Séraphique embarked in Loango, a Portuguese slavery harbor in Congo known to be a global trade hub crossed for 250 years by 2.5 million of

slaves (Eltis and Radburn, 2019).

By the mid-1550s, Loango hosted a system of slave prisons/warehouses whose inbound and outbound operations were temporally coordinated according to surveillance of slaves and the prediction of revolts. Known as "a secure *environment* in which to trade and hold captives for extended periods of time" the system leaded Portugal to be a global hegemonic empire of the XVI century, setting a *standard* unreached by any of the European powers in 250 years (ivi, 551).

For each travel, slave ships used to anchor offshore between the Bight of Benin and Biafra stationing with empty cargoes from one to two years (Gregg & Ruderman, 2021). To reduce as possible the slaves' cooperation, the merchants used to change the pace of the vessels looking for "goods that speak different language idioms (Rediker, 1987, 55). At the same time, as waiting times increased the costs of feeding the human cargos — and so the risk of revolts (Gregg & Ruderman, 2021) — the slaves were gathered in fortified warehouses on islands or on the shores of Ouidah, Lagos, Aného, Grand-Popo, Agoué, Jakin, Porto-Novo, and Badagry, embarking only "when ships reached their full "complement," normally be just prior to departure" (Eltis and Radburn, 2019, 551). The system of Loango lasted until the 21st century and was renovated when steam powered vessels were deployed to outrun British naval cruisers to illegally transport "high-value *perishable* human cargoes" (ivi, 554).

The time diagrams translated the slaves knowledge — their socialized intelligence upon acts of refusal to forced labor — into *information* whose value, once standardized, became effective for the compression of time — of travel and cargo inbound-outbound- through space.

Hence, as well as in hold diagrams the slaves struggles for freedom were the primary concern for the development of the barricade, the nets, and other technologies of the slave ship, slave rebellions were the primary cause for its inbound times, shaping the geographies of the vessel circuits.

The organization of slave systems as the Loango urban port shaped the political, urban and economical "underdevelopment" of West Africa while acting as an extractive site for the accumulation of European industrial capital (Smallwood, 2007; Whatley, 2022). Indeed, a logic of space, time and information compression shaped the historical global corridors where the telegraphic cables and the network of contemporary digital and logistics infrastructures were built. Moving from the Marxian theory of abstraction, I analyze in the next paragraph how slave ships defined circuits of planetary urbanization as *machines of abstraction*.

3. *Machines of abstraction. Space, value, and automation in the Atlantic Trade*

Can the slave ship be framed as a machine? According to Babbage (1832, 131-136), "when each process has been reduced to the use of some simple tool, the union of all these tools, actuated by one *moving power*, constitutes a machine". The theory — developed at the time of the steam engine — can be traced back to the Atlantic trade since all the mentioned processes, actuated by the moving power of the slave vessel, were set to augment the value of transit enslaved labour: the trade final product. In fact, moving from De Prony's algorithm theory, the

mentioned definition by Babbage was implemented by his "method of difference" that stated that machines are *when* their division of labour also allows the precise computation of labour costs (Babbage 1832, 137).

While this industrial principle — called 'the Babbage principle' — became a cornerstone for computer prototypes like the Difference Engine and the Analytical Engine, the slave ship can be framed as a machine where 'environmental' and 'logistical medias' (Rossiter, 2016; Rossiter & Zehle, 2023; Zieger, 2021) were set according to earlier logics and aesthetics of automation for the production of labour as a commodity.

What was the value of slaves? A focus on this point makes clear the difference between the production of industrial factories and the one of slave ships.

According to the Asiento regulation, to the standards of 1713, one enslaved male at least 58 inches tall "with no defect" was one 'Piezas de Indias', women 0.8 and other people, like children, who did not meet this criterion and were 'cheaper to transport'. Nevertheless, as we saw in the last paragraph, the slave market did not have a single set price for enslaved people; "rather, the price of captives increased steadily over time, likely reflecting the pressures faced by the captain as he waited in the port of Loango" (Gregg & Ruderman, 2021).

Since for the merchants the cost of slaves increased per each additional month in Loango, once slaves embarked, the voyage of the ships was set to increase slaves value that was firstly related to the cost of shipping, then *augmented* through the mentioned informational systems, artefacts and organizational methods (as the race and the wage).

In the Marxian labor theory, the process through which labor is turned into a commodity is called *abstraction*. The term *abstract* does not refer to a mental generalization of work, but to a *real hypostatization* — "an 'inversion' of subject and predicate" — that takes form when labor is translated into market value (Bellofiore, 2016, 57).

Since before the moment of production, the hypostatization of labor value takes place in the circuits of labor market (Napoleoni, 1972), the slave ship, rather than an earlier form of industrial production, can be framed as a *machine* for the *abstraction* of labor value in the moment of its *circulation*.

Moving from the Marxian theory of value (M-C-M) the technologies of the slave ship *hypostatize* forced and transit labor value according to a circulatory move described by Napoleoni and Bellofiore: "from the final circulation closing the circuit of capital (the commodity market, where abstract labor is *created*), to the moment of production as the central phase of the circuit" — where abstract labor is firstly "latent" and after circulation "confirmed" — (Bellofiore, 2016, 55).

But was labor value the sole product of these *machines*? How was it produced?

In the last paragraph I showed that, as late as the nineteenth century (1500-1850), rather than "close to societies known to have slaves' stocks" — "to which colonial traders possessed very little *knowledge*" — slaves' ports and warehouses were distributed according to correlations between the time and the cost of transporting goods (Whatley 2022, 412).

Although the term 'abstraction' may be misleading, the process was possible only through the production of infrastructural space: a contested field between capital

and its resistances in the shaping of corridors within sites of capital circulation (the sea) and sites of production (as the Caribbean colonial plantations). We can affirm that as well as the industrial factories shaped value by turning territorial landscapes into matrix of centrality between urban agglomerations and their peripheries, slave ships turned seascapes into landscapes that were operational for the accumulation of abstract labor value through its circulation. How to frame this process?

Moving from the Marxian theory on abstract labor, Lefebvre defined the production of the urban space as a process of abstraction directly related to capitalist forms of modernization (Lefebvre, 2009 [1971]). From here, Brenner and Schmidt (2014) defined *operational landscapes* as sites where the metabolism of the urban condition is constantly produced within a dialectic of so-called *concrete abstractions*.

Recalling the Chakrabartian notion of History 1 (the history of capital), and History 2 (the history of its subjectivities) concrete abstractions instance the rising of a planetary urban condition as a historical result between "the production of a*bstract space*", where value is shaped "by capital circulation", "and of *concrete differential spaces* generated through local struggle and resistance" (Schmidt, 2018, 599).

By merging the Marxist and Operatist theory on automation with the Lefebvrian analysis of the production of urban space, slave ships can be considered machines of abstraction, where earlier technologies of automation translated the socialized intelligence of slave revolts into logics of space, time and information compression oriented at the production of urban space and the reproduction of abstract labor. In this context, documents on board can be framed as *archives of automation*, enabling Southern lineages for a Black Atlantic genealogy of the contemporary urban automation.

4. Toward a Black Atlantic archaeology of urban automation

Trough colonial archives, the article analyzes how, before the Babbage machine of the XIX century-the first industrial machine according to Marx, the earlier genealogy of automation lied in the coding, standardization and prediction of labor resistances in slave ships, as these were turned into *machines of abstract labor* in the sphere of *capital circulation*.

In fact, as vessels were turned from goods to forced labour carriers, the *logistical fantasy* of the deck — to deal with *automata* — clashed with the social intelligence and cooperation of the so called "living dead aboard" (Smallwood, 2007) inspired by the *old dream* to resist and revolt (Harney and Moten, 2016).

According to a Marxist theoretical framework, the article shows how along the maritime circuits of the first global value circulation, the organization of the slave ship reflected the "twofold nature of violence in the capital's use of technology to control and diminish its dependence upon labour" (Panzieri, 1961, 63)

Building on the operatist analysis that positions labour struggles as a primary driver of capitalism's technological advancements (ivi), artifacts like the barricado can be analysed as environmental media (Rossiter & Zehle, 2023). The concept, as defined by Neilson and Rossiter (2019), describes contemporary learning systems (such as machine learning) at the core of automation technologies. In this context,

the rise of organizational forms as race and wage can be analysed as a 'logistical episteme' to segment and exhaust the cooperation between waged and forced labour. This division shaped what has been later identified as the 'aesthetics of contemporary automation' (Neilson and Rossiter, 2019).

As a result, while these archives can be seen as precursors to what has been defined, within the sphere of production, as the inner "logics of automation" (Pasquinelli, 2023), slave ships like the Marie Seraphique should not be framed merely as prototypes of industrial factories. Instead, within the sphere of circulation, they functioned as machines for the abstraction of labour value through the production of urban space.

Although a comprehensive genealogy of automation would require further research, these *archives of automation* represent initial steps toward a Black Atlantic archaeology of the planetary urbanization. New research avenues can emerge from this context. While the legacy of colonial socio-spatial relationships has shaped the uneven global development (Schmidt, 2018), the centrality of slave revolts calls for further 'alternative genealogies of planetary urbanization' (Vegliò, 2021). This perspective shifts the focus to Global South's peripheries where seascapes, rather than continental cities, can serve as crucial "repositories of lineage" (Rezeire, 2017).

Bibliography

Alquati R (1963). Composizione organica del capitale e forza-lavoro alla Olivetti, Part 2. *Quaderni Rossi* 3.

Babbage, C. (1832). *On the Economy of Machinery and Manufactures*. London: Charles Knight.

Bellofiore, R. (2016). Marx after Hegel: Capital as Totality and the Centrality of Production. *Crisis and Critique*, 3(3), 31-64.

Braverman, H. (1974). *Labour and Monopoly Capital: The Degradation of Work in the Twentieth Century*. New York: Monthly Review Press.

Brenner, N., & Schmid, C. (2014) The 'urban age' in question. *International Journal of Urban and Regional Research* 38: 731–755.

Brenner, N., Madden, D. J., & Wachsmuth, D. (2011). Assemblage urbanism and the challenges of critical urban theory. *City*, 15(2), 225-240.

Burawoy M (1979) *Manufacturing Consent: Changes in the Labor Process Under Monopoly Capitalism*. Chicago, IL: The University of Chicago Press.

Burnard, T., & Garrigus, J. (2016). *The Plantation Machine: Atlantic Capitalism in French Saint-Domingue and British Jamaica*. University of Pennsylvania Press.

Cardoso, R. (2022). Seeing Luanda from Salvador: lineaments of a Southern Atlantic urbanism. *Antipode*, 54(3), 729-751.

Coleman, D.c (2007). *Henry Smeathman and the natural economy of slavery*. Essays and Studies, 2007, 130-150.

Couling, N. (2020). *The urbanisation of the sea: From concepts and analysis to design*. TU Delft Open.

Crowley, J. E. (2016). Sugar Machines: Picturing Industrialized Slavery. *The American Historical Review*, 121(2), 403-436.

Deleuze G and Guattari F (1972) *L'Anti-Oedipe. Capitalisme et schizophre'nie*, Vol. 1. Paris: Minuit [translated as: *Anti-Oedipus: Capitalism and Schizophrenia*, Vol. 1. Minneapolis: University of Minnesota Press, 1983].

Deleuze G and Guattari F (1980) *Mille Plateaux. Capitalisme et schizophre´ nie*, Vol. 2. Paris: Minuit [translated as: *A Thousand Plateaus: Capitalism and Schizophrenia*, Vol. 2. Minneapolis: University of Minnesota Press, 1987].

Ducoin, J., (2000). Les pirates noirs. Le négrier nantais la Concorde et le pirate anglais Edward Teach dit Blackbeard. In *Association Les Anneaux de la Mémoire*, (2002). Cahiers Des Anneaux De La Mémoire N-04. Les Traites En Afrique. Pirates Noirs Et Marins De La Traite. Nantes.

Fiori, N. (2020). Plantation energy: From slave labor to machine discipline. *American Quarterly*, 72(3), 559-579.

Gallandat, D. H. (1769). *Noodige onderrichtingen voor de slaafhandelaaren* (Vol. 1). by Pieter Gillissen.

Gregg, A., & Ruderman, A. (2021). *Cross-cultural trade and the slave ship the Bonne Société: baskets of goods, diverse sellers, and time pressure on the African coast* (No. 112507). London School of Economics and Political Science, Department of Economic History.

Haenlein, M., & Kaplan, A. (2019). A brief history of artificial intelligence: On the past, present, and future of artificial intelligence. *California management review*, 61(4), 5-14.

Harney, S., & Moten, F. (2016). *The undercommons: Fugitive planning and black study*.

Huang Z., & Huang K. (2024). *Henri Lefebvre and planetary urbanization: Progress and prospect*. Eco Cities. 2024; 5(2): 2890.

Kinkor, K. 2001. *Black men under the black flag. In Bandits at sea: A pirates reader*, ed. C.R. Pennell. New York: New York University Press.

Lefebvre H (2009/1971) *Everyday Life in the Modern World*. *London: Transaction*.

Linebaugh, P., & Rediker, M. (1990). The many-headed hydra: sailors, slaves, and the Atlantic working class in the eighteenth century. *Journal of Historical Sociology*, 3(3), 225-252.

Marx K (1847) Mise`re de la philosophie. Paris and Brussels [translated as: The Poverty of Philosophy. In: Marx K and Engels F, *Collected Works*, Vol. 6. London: Lawrence and Wishart, 1976].

Marx K (1867) *Kapital. Kritik der politischen O¨ konomie*, Vol. 1. Hamburg: Verla von Otto Meissner [translated as: *Capital: A Critique of Political Economy*, Vol. 1. London: Penguin, 1981].

Mezzadra, S., & Neilson, B. (2024). Operations of Platforms. A Global Process in a Multipolar World. In *Capitalism in the Platform Age: Emerging Assemblages of Labour and Welfare in Urban Spaces* (pp. 15-31). Cham: Springer International Publishing.

Munn, L. (2020). From the Black Atlantic to Black-Scholes: Precursors of spatial capitalization. *Public Culture*, 16(1), 92-110.

Mwema, E., & Birhane, A. (2024). Undersea cables in Africa: The new frontiers of digital colonialism. *First Monday*.

Napoleoni, Claudio 1972, *Lezioni sul Capitolo sesto inedito*. Torino, Boringhieri.

Neilson, B., & Rossiter, N. (2019). Theses on automation and labour. In *Data Politics* (pp. 187-206). Routledge.

Ongweso, JR.; E. (2024) *AI, slavery, surveillance and capitalism*, Tech Bubble https://thetechbubble.substack.com/p/ai-slavery-surveillance-and-capitalism

Pasquinelli, M. (2015). Italian operaismo and the information machine. *Theory, Culture & Society*, 32(3), 49-68.

Pasquinelli, M. (2023). *The eye of the master: A social history of artificial intelligence*. Verso Books.

Peters, J. D. (2021). *Assembly codes: The logistics of media*. Duke University Press.

Pickren, G. (2018). 'The global assemblage of digital flow' Critical data studies and the infrastructures of computing. *Progress in Human Geography*, 42(2), 225-243.

Radburn, N., & Eltis, D. (2019). Visualizing the Middle Passage: the Brooks and the reality of ship crowding in the transatlantic slave trade. *Journal of Interdisciplinary History*, 49(4), 533-565..

Rediker, M. (1987). *Between the Devil and the Deep Blue Sea: merchant seamen, pirates and the Anglo-American maritime world*, 1700-1750. Cambridge University Press.

Rediker, M. (2007) *The Slave Ship: A Human History*. New York: Viking/Penguin, 2007, 448.

Rezaire, T. (2017). "Tabita Rezaire - Fighting for Love."*Autre Magazine*. https://autre.love/interviewsmain/tag/tabitarezaire?fbclid=IwAR2n_CwLHoMRgZrmQKVH_kRW52LXXl2Gvv1P9xeMteuSSpUuObRy00FwvR0.

Rossiter, N. (2016). *Software, infrastructure, labor: A media theory of logistical nightmares*. Routledge.

Rossiter, N. (in press 2025) 'The Logistical Episteme', in Grant Bollmer, Katherine Guinness, and Yiğit Soncul (eds), *De Gruyter Handbook of Digital Cultures*, Berlin: De Gruyter

Rossiter, N., & Zehle, S. (2023). Logistical media and environmental media: Energy, war and the politics of distribution. *Journal of Environmental Media* 4(1) 77-89

Schmid, C. (2018). Journeys through planetary urbanization: Decentering perspectives on the urban. *Environment and Planning D: Society and Space*, 36(3), 591-610.

Smallwood, S. E. (2007). African guardians, European slave ships, and the changing dynamics of power in the early modern Atlantic. *The William and Mary Quarterly*, 64(4), 679-716.

Smeathman (1807), "Oeconomy of a Slave Ship," in Brycchan Carey and Peter J. Kitson (eds.), Slavery and the Cultures of Abolition: *Essays Marking the Bicentennial of the British Abolition Act of 1807* (Rochester, 2007), 146.

Starosielski, N. (2015). *The undersea network*. Duke University Press.

Tronti M (1962) *La fabbrica e la società* . Quaderni Rossi 2.

Tronti M (1980 [1966]) The strategy of refusal. *Semiotext(e)* 3(3): 28–34.

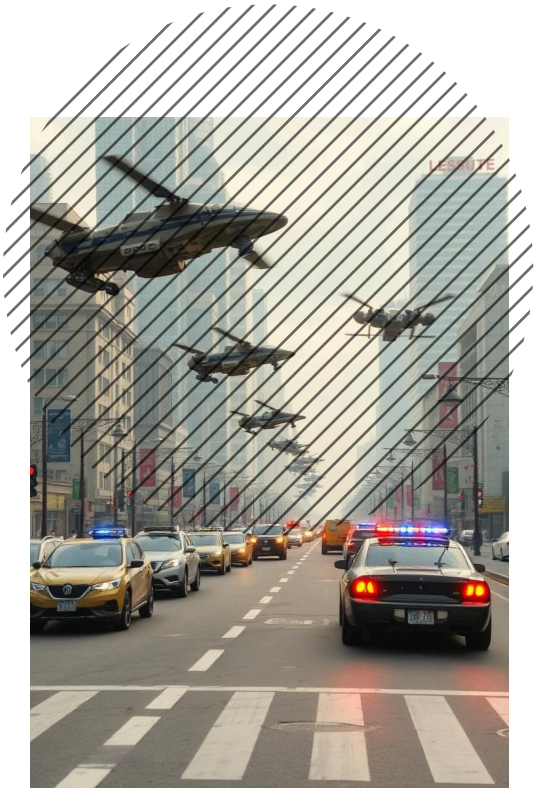
Vegliò, S. (2021). Postcolonizing planetary urbanization: Aníbal Quijano and an alternative genealogy of the urban. *International Journal of Urban and Regional Research*, 45(4), 663-678.

Vercellone C (2007) From formal subsumption to general intellect: Elements for a Marxist reading of the thesis of cognitive capitalism. *Historical Materialism* 15(1).

Whatley, W. (2022). How the international slave trades underdeveloped Africa. *The Journal of Economic History* 82(2), 403-441.

Whittaker, M. (2023). Origin stories: Plantations, computers, and industrial control. *Logic (s)*, 19.

CHAPTER 5



CHAPTER 5

Alternative Cosmotechnics for Urban Automation: the techno-geographical milieu of a neighborhood AI

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Introduction

This article addresses the relationship between computational automation and urban life by engaging with critical technology studies and cybernetic thought, specifically focusing on the emancipatory perspectives on automation emerging from speculative theory and art-driven technical practices.

It begins by considering how contemporary models of urban automation—from smart cities and platform logistics to urban AI—heavily rely on the mediation and capture of collective interactions with urban environments as sources of both value and intelligence. This discussion draws from recent critiques of AI and platform urbanism, as well as from my own PhD research. Building on this initial thematisation, the article then focuses on how computational automation and algorithmic learning integrate within urban spaces, understanding this process through cybernetic thought, particularly in light of its reconstructions by authors like Yuk Hui, N. Katherine Hayles, and Luciana Parisi. It explores Hui's recent efforts to reconcile cybernetics with questions of locality and milieu through the concepts of recursivity and technodiversity, and places this approach in conversation with decolonial critiques of automation.

Following this critical framework, the article explores alternative political

perspectives for urban automation by thinking through the artistic practice of Salvatore Iaconesi and Oriana Persico, specifically focusing on IAQOS; the "neighbourhood artificial intelligence in open source" they developed in Rome's Torpignattara neighbourhood. I propose considering this project as a speculative material effort to produce a counter-hegemonic imaginary for AI and an alternative cosmotechnics. The IAQOS experiment diverts urban automation from models of utility, instrumentality, and domination, offering new assemblages, practices, and conceptual categories for reimagining the technological becoming of the local.

The article uses the methods and perspectives of digital media theory and critical technology studies, and draws specific insight from a workshop with Oriana Persico that took place at the University of Naples L'Orientale in April 2024, where I participated as a discussant.

From smart cities to platform urbanism

The presence of automated technologies operating in the background of everyday life appears as an increasingly central force reshaping urban spatiality. Modern processes of urbanization have historically been deeply intertwined with the development of technical infrastructures (Mumford 1963). The emergence of 19th-century communication technologies and electric light, the establishment of industrialisation as a hegemonic socioeconomic paradigm, and the rise of the information age have all occurred in dialogue with discursive and material reconfigurations of urban space (Castells 2007; Lefebvre 1991). However, compared to 20th-century cityscapes, the ubiquitous and discreet character of contemporary networked technologies affords an *ambient* quality to their operations, that makes them more seamlessly embedded within urban environments.

Precisely because their operations tend to slip below the threshold of critical scrutiny, many have investigated the relationship between contemporary automation and urban life. A key topic of inquiry has been the technocratic logic of "urban neoliberalism," which has altered governmentality and citizenship, increasingly contaminating traditional apparatuses with the ethos of the tech industry, its lean organisational models and its consumer-oriented logic of user access (Graham et al. 2019). Through the new affordances of information technologies and data analytics, this logic has produced the now widely established paradigm of *smart cities*. Contemporary smart urbanism conceptualises the city as a "system of systems," whose efficiency can be enhanced through data-driven management, employing algorithmic processes, sensor networks, and responsive control infrastructures to create a more dynamic organisation and frictionless delivery of services (Kitchin 2014). In parallel with the smart city paradigm, the pervasive mediation of platform technologies within social life has brought forth "platform urbanism": a complex of socio-technical processes through which platforms metabolise power and exert control over urban interactions "through a strategic deployment of conjunctural geographies — a way of being simultaneously embedded and disembedded from the space-times they mediate" (Graham 2020). In my PhD research, I specifically examined how platform technologies integrate their operations within the city by mediating

labour and coordinating its logistical dimension, entangling with urban dynamics such as commuting routes, last-mile logistics, and property development. Within platform urbanism, the embedding of automated infrastructures within the city appears as a consequence of platforms' capacity to mobilise and capture our collective ability to 'know,' interpret, and interact with urban environments.

AI and the epistemic mediation of urban life

This capture of collective capacities is central to what may currently be the most salient form of urban automation: urban artificial intelligence. This refers to an emergent complex of technologies operating within cities — from autonomous vehicles to software agents — originating from the data-driven proposals of smart cities and building on the embedded oligopolistic power of platform urbanism. Urban AIs are characterised by their capacity to develop through automated interaction with their surrounding environment, learning from local contingencies and regulating their behaviour accordingly (Palmini & Cugurullo 2023).

This focus on learning makes the ongoing supply of local information fundamental for automated intelligences to embed within the urban fabric. Last year, Meta halted the launch of its AI models in Europe after regulators took issue with their plan to employ publicly available user data for training purposes. In the company's words: "without including local information we'd only be able to offer people a second-rate experience. This means we aren't able to launch Meta AI in Europe at the moment" (Chee 2024). This example illustrates how machine learning relies not just on harvesting generic data but specifically data produced by *particular* publics situated within certain *geographical specificities* — underscoring the importance of *locality* to AI models (Mörtenböck & Mooshammer 2020).

In his socio-technical history of AI, Matteo Pasquinelli assembles a labour theory of automation that foregrounds its politico-epistemic relationship with social cooperation. His work highlights how automation does not develop through the top-down application of techno-science but rather emerges by capturing the diagrams of the division of labour by which social cooperation organises bodies, objects, and their relations. AI constitutes no imitation of biological intelligence, but rather an ongoing capture and automation of general intellect. By synthesising, the division of labour, automation also performs an epistemic function, embodying certain metrics of labour and calculations of its value (Pasquinelli 2023). From this perspective, AI is also constituted through the political and epistemic mediation of social cooperation — the collective embodied intelligence of the common.

This is particularly interesting for urban automation, as the paradigms of smart cities and AI urbanism clearly mobilise specific ways of *knowing* the city. In fact, they understand the urban environment as a system of actors and behavioural variables that can be known by capturing the routine patterns in which they manifest (Picon & Hill 2019). Cities are essentially conceptualised as cybernetic systems.

Automated learning, cybernetics and the techno-geographical milieu

Establishing itself as the science of auto-regulation during the decades following WWII, cybernetics laid the epistemological foundation for the emergence of contemporary AI (Hayles 1999; Hui 2024). According to Yuk Hui, "the generalization of recursive algorithms and their implementation in digital computers concretize cybernetic thinking and its applications in almost all social, economic, and political domains" (2020, p. 56). As computation pervades the social fabric, a generalised cybernetic episteme becomes "omnipresent, like air" (Hui 2024, p. 13).

Cybernetics and machine learning share a common concern with processing contingency, which means dealing with irregularity across a milieu through the progressive structuring of unknowns. Increasingly, contemporary AIs engage with the urban milieu through networks of algorithmic learning. These automated systems develop through the inductive models of so-called "connectionist" AI, where intelligence emerges from experience of the world, self-organising through environmental interaction and pattern recognition (Hayles 1999; Pasquinelli 2023). Automated learners do not enter the city through top-down mechanistic programming imposed on urban life but rather as emerging systems; processing information from their surroundings, learning by continually returning to themselves through feedback, and progressively self-organising.

Understanding computational automation in light of cybernetic thought — and its reconstructions by authors like Katherine Hayles, Yuk Hui, and Luciana Parisi — can help us develop a political perspective on urban automation that moves beyond technocratic solutionism and dystopian critique. The framework of autopoiesis is particularly useful for understanding cybernetics' concern with the relations between organisms and their environments. Chilean biologists Humberto Maturana and Francisco Varela describe autopoiesis as a process of self-making and self-organising through feedback, intrinsic to living systems (1980). Significantly, they consider cognition central to autopoiesis. Autopoietic cognitive systems develop through "enaction" (Varela et al. 1992); a process of perceptually guided engagement with contingency in which an organism self-organises through "structural coupling" with its environment (Maturana & Varela 1980). Following this wave of cybernetic thought, the development of automated learning was modelled much more around biology than neuroscience, as in Rodney Brooks' "Situated AI," where artificial systems learn through environmental immersion and embodied interaction without any preconceived models of the world (Hayles 1999). Building on these notions of autopoiesis and enaction, Hayles understands cognition as a process connecting computation, living beings and their associated environments into "nonconscious cognitive assemblages" — a functional integration which she recently called "technosymbiosis" (2024). As automated cognitive systems structurally couple with the city through feedback and environmental enaction, urban space is constituted as a "techno-geographical milieu" (Simondon 2017).

Recursivity, technodiversity and the question of locality

This line of thought suggests a notion of urban automation that exceeds its use as a

tool of control and capture, potentially breaking with hegemonic imaginaries of automation. However, cybernetic thought may still be insufficient for imagining an emancipated relationship between automation and urban life, due to limitations that Hui explores through the question of the milieu and of locality. According to the author, "the logic of cybernetics remains formal; therefore, it underestimates the milieu by reducing it to mere functionality based on feedback, so that the milieu can be integrated into the operation of the technical object. In this respect, the milieu is exposed as a scientific and technological object, while its position within the genesis of technicity is ignored" (Hui 2020, p. 59). This reductive relationship with the milieu highligts the impossibility of a technological relationship with locality beyond exploitation and instrumentality, which Hui sees as a historical limit of Western techno-science: "one of the major failures of the twentieth century is the inability to articulate the relation between locality and technology, and the reliance on an almost standardized ecological thinking endowed with a strong European humanism" (Hui 2020, p. 58).

These homogenising effects call for an epistemological reconstruction aimed at rethinking and "detoxifying cybernetics through redefining its collectivities and refocusing its mission through its environmental and computational concerns" (Hayles 2024, p. 97). For Hui, this requires challenging the contemporary technological monoculture through "technodiversity," reintroducing the question of locality at the core of technical thought and resituating technology within "cosmo-geographical specificity"; not as a question of identity politics, but as a means to "reflect on the technological becoming of the local" (Hui 2020, p. 59-61).

Hui identifies an opportunity for this situated, open cybernetics in the idea of recursivity: the category of feedback operations by which an autopoietic system routinely recalls itself, adapting to the contingencies of its milieu. This recursive adaptability to environmental uncertainty opens automation to indeterminacy and *incomputability* — what cannot be known in advance — and therefore to difference and *otherness*. Hui sees this openness to contingency as a "search for pluralism as indetermination, and therefore as multiple cosmotechnics," which means a search for technodiversity, for alternative temporalities and onto-epistemologies of automation, already intrinsic to recursivity and autopoiesis (Hui 2019, p. 269).

A decolonial critique of recursivity

In light of Hui's work, recursivity and contingency, as fundamental categories of automation, seem to offer a political opportunity for resistance against technological monoculture, presenting a core of indeterminacy within automation, that could be taken up by social invention. However, authors such as Luciana Parisi have problematised this perspective by mobilising decolonial and abolitionist critiques of techno-science. According to this critique, the openness of recursivity per se does not resolve the epistemological problem of automation. Sylvia Wynter's engagement with recursive epistemologies shows how the bio-economic paradigm of Western reason reproduces its colonial episteme not via the mechanical repetition of the same, but precisely through cyclical reorganisation and adaptation to otherness (Parisi 2022).

Rather than escaping the colonial logic of Western techno-science, recursive epistemologies may simply re-code it in new systems. This is evident not only in phenomena such as algorithmic discrimination, but also in the racial grammar that underpins our modern relationship with automation: the enduring notion of machines as mechanical slaves tasked with undesirable labour and functioning as prostheses of human will-which recodes the logic of racial slavery (Atanasoski & Vora 2019).

If technodiversity aims to resituate automation in relation to locality and alternative cosmotechnics, then recursivity needs to be problematised as a fundamental mechanism through which the model of Western capitalist technology cyclically reproduces its colonial logic in new socio-technical configurations. Urban automation can not produce technodiversity simply by incorporating locality and geographical specificity. Instead, it risks of absorbing otherness into its recursive schema, further entrenching the logic of instrumentality and domination within the urban fabric.

These critiques suggest that reconstructing the relation between automation and urban life requires political and epistemic invention *beyond* recursivity. This presents a key challenge for contemporary technological thought: not simply reclaiming technology from the master, not merely opposing transcendental reason with the general intelligence of the common, but breaking the recursive reproduction of the use/instrument and master/slave schema, abolishing its colonial grammar and remaking the categories by which we understand and imagine technology. Urban automation constitutes a key site where experimental proposals for new cosmotechnics can be imagined and materialised.

Speculative cosmotechnics in Torpignattara: the artistic intervention of IAQOS

I propose to explore a speculative political perspective on automation and urban life by thinking through the artistic and technical practice of Salvatore Iaconesi and Oriana Persico, specifically looking at IAQOS; the "neighbourhood artificial intelligence in open source" they developed in Rome's Torpignattara neighbourhood between 2018 and 2019 — a project funded by the Italian Ministry of Culture as an experiment in urban regeneration through AI, data and art (Iaconesi & Persico 2021).

This constitutes an attempt to materialise a speculative techno-geographical milieu by experimenting with AI outside of the hegemonic extractive models of corporate platforms. Besides its open-source implementation, IAQOS is particularly interesting as an art-driven exercise in what the artists call *cyberdiversity*. The project proposes alternative relations between automation and the urban milieu, introducing AI in Torpignattara not as a service, but rather as a *new inhabitant*.

Iaconesi and Persico presented the imminent arrival of a "neighborhood AI" through guerrilla communication, along with a series of workshops and community actions, visiting the local primary school, associations and citizen groups, and engaging a wide variety of people, from kids and families to storekeepers, and activists. Being Torpignattara one of Rome's

most multicultural areas, IAQOS was pre-trained in 54 languages. Their narrative approach was based on the idea of 'raising' IAQOS in a non-biological family/neighbourhood. Through messaging boxes, devices and screen interfaces distributed across the neighbourhood, residents could share with the artificial newborn something they thought it should know about the area, the city, and the world — from gossip and tips, to local knowledge and deep thoughts. These contributions became the training data for IAQOS's linguistic model. After its official 'birth,' people were able to interact with IAQOS, in everyday spaces - such as schools and cafes - 'raising' the newborn and witnessing its development, interrogating and questioning its learning, as well as their participation in it (Iaconesi & Persico 2021).

We can see this project as a productive response to Hui's call for moving beyond the universalising rationality of our hegemonic technological monoculture, resituating technics in relation to locality. Rooted in the contingency of the local, the artistic intervention of IAQOS constructs a model of urban automation without a normative image of humanity. Iaconesi and Persico — who had already birthed a linguistic AI in the past (2021) — propose with IAQOS a new form of human/non-human community, a non-biological model of neighborhood, kinship, and care. This represents a speculative material effort toward a counter-hegemonic imaginary and an alternative cosmotechnics.

This is done by proposing an original model for integrating AI within the urban milieu, foregrounding (what they call) the New Living as a form of socio-technical individuation across data, automation, living beings, and locality. Unlike Big Tech's hegemonic infrastructures, IAQOS does not offer automation as service or utility, but rather as relation, communication, learning, sensation, and friction. Automated intelligence here does not coincide with predictive power, but with a media intelligence that refuses instrumentality as a universal measure of technological relations. IAQOS deviates from the hegemonic AI cosmology, where intelligence is imagined as immaterial and cloud-based, extracting data from the social while serving the human master. Instead,

IAQOS is fully integrated within the local ecosystem and its temporalities. This foregrounds a different understanding of urban life: not as a complex of utilities and behavioural patterns, but as a relational system of living beings, data and computation, rituals and spaces, that exceeds the reductive model of smart cities.

The role of data practices is central to this speculative cosmotechnics. In contrast with the hegemonic notion of data as property, or as a medium of control, IAQOS figures data as a medium of relation, of collective care and self-organisation across computation, living beings, and environments.

This notion of data as relational media opens up different forms of collective individuation. It imagines a different position for human beings in relation to automation and locality; no longer the measure of the world, but perhaps a node between computation and environments.

Writing at the dawn of the electronic information age, Gilbert Simondon notes how technical evolution seems to develop not towards an increase in pure automation, which functions

autonomously from the human, but rather towards the emergence of technical systems integrated with their associated milieus through self-organisation (2017). These “open machines” present a certain potential for what Thomas LaMarre theorises as “technical equality”; an emancipated relationship between human and machine. Not a return to an artisanal, modality of technics, but a new collective longer individuation where automation is not domination of matter, and the human a master of instruments. Rather, the human figures as an organiser, interpreter, or “transducer” between technical objects and environments (Combes 2012).

This transindividual, techno-geographical milieu resonates with the speculative imaginary of IAQOS, foregrounding an emancipatory perspective that goes beyond the reappropriation technology, towards the radical rethinking of the categories through which the relation between technology and urban life is imagined.

Bibliography

Atanasoski, Neda, and Kalindi Vora. *Surrogate Humanity: Race, Robots, and the Politics of Technological Futures*. Illustrated edition, Duke University Press Books, 2019.

Castells, Manuel. "Space of Flows, Space of Places: Materials for a Theory of Urbanism in the Information Age." *Re-Thinking Technology: A Reader in Architectural Theory*, edited by William W. Braham et al., Routledge, 2007, pp. 440–56. Talis Aspire

Chee, Foo Yun. "Meta Pauses AI Models Launch in Europe Due to Irish Request." *Reuters*, 14 June 2024. *www.reuters.com*, https://www.reuters.com/technology/artificial-intelligence/meta-will-not-launch-meta-ai-europe-now-2024-06-14/.

Combes, Muriel. *Gilbert Simondon and the Philosophy of the Transindividual*. Translated by Thomas LaMarre, MIT Press, 2012.

Graham, Mark, et al., editors. *How to Run a City Like Amazon, and Other Fables*. Meatspace Press, 2019.

Hayles, Katherine. "Detoxifying Cybernetics: From Homeostasis to Autopoiesis and Beyond." *Cybernetics for the 21st Century Vol. 1: Epistemological Reconstruction*, edited by Yuk Hui, Edizione con copertina flessibile, Hanart Press, 2024, pp. 85–100.

Hayles, N. Katherine. *How We Became Posthuman: Virtual Bodies in Cybernetics, Literature, and Informatics*. 74th ed. edition, University of Chicago Press, 1999.

Hui, Yuk. "Machine and Ecology." *Angelaki*, vol. 25, no. 4, July 2020, pp. 54–66. *Taylor and Francis+NEJM*.

---. *Recursivity and Contingency*. Rowman & Littlefield International, 2019.

---. "Why Cybernetics Now?" *Cybernetics for the 21st Century Vol. 1: Epistemological Reconstruction*, Edizione con copertina flessibile, Hanart Press, 2024, pp. 11–22.

Iaconesi, Salvatore, and Oriana Persico. *When My Child Is AI. Learning and Experiencing through AI Outside the School: The Experiences of a Community AI*. Jan. 2021.

Kitchin, Rob. "The Real-Time City? Big Data and Smart Urbanism." *GeoJournal*, vol. 79, no. 1, 2014, pp. 1–14.

Lefebvre, Henri. *The Production of Space*. Translated by Donald Nicholson-Smith, 1st edition, Wiley-Blackwell, 1991.

Maturana, H. R., and F. J. Varela. *Autopoiesis and Cognition: The Realization of the Living*. 1st edition, D. Reidel Publishing Company, 1980.

Mörtenböck, Peter, and Helge Mooshammer. *Data Publics: Public Plurality in an Era of Data Determinacy*. 1° edizione, Routledge, 2020.

Mumford, Lewis. *Technics and Civilizations*. Harcourt, 1963.

Palmini, Otello, and Federico Cugurullo. “Charting AI Urbanism: Conceptual Sources and Spatial Implications of Urban Artificial Intelligence.” *Discover Artificial Intelligence*, vol. 3, no. 1, Apr. 2023, p. 15.

Parisi, Luciana. “Recursive Philosophy and Negative Machines.” *Critical Inquiry*, vol. 48, no. 2, Jan. 2022, pp. 313–33. journals.uchicago.edu (Atypon).

Pasquinelli, Matteo. *The Eye of the Master: A Social History of Artificial Intelligence*. Verso, 2023.

Picon, Antoine, and Thomas Shay Hill. “Is the City Becoming Computable?” *Architecture and the Smart City*, Routledge, 2019.

Simondon, Gilbert. *On the Mode of Existence of Technical Objects*. Translated by Cecile Malaspina and John Rogove, 1st edition, Univ Of Minnesota Press, 2017.

Varela, Francisco J., et al. *The Embodied Mind: Cognitive Science and Human Experience*. Revised ed. edition, Mit Pr, 1992.

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