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2024

<https://doi.org/10.25969/mediarep/23675>

Veröffentlichungsversion / published version

Rezension / review

Empfohlene Zitierung / Suggested Citation:

Quaranta, Domenico: A time panorama: Unpacking 'Calculating Empires'. In: *NECSUS_European Journal of Media Studies*. #Enough, Jg. 13 (2024), Nr. 2, S. 352–362. DOI: <https://doi.org/10.25969/mediarep/23675>.

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A time panorama: Unpacking ‘Calculating Empires’

Domenico Quaranta

NECSUS 13 (2), Autumn 2024: 352–362

URL: <https://necsus-ejms.org/a-time-panorama-unpacking-calculating-empires/>

Calculating Empires: A Genealogy of Technology and Power, 1500-2025 took place at Osservatorio Prada, Milan between 23 November 2023 and 29 January 2024. The venue proved curiously appropriate for the exhibition conceived by artists and researchers Kate Crawford and Vladan Joler, engaging with a project about imperialism, control, time, politics, and technology in an intriguing, multi-layered dialogue. Osservatorio, Fondazione Prada’s center devoted to visual experimentation and research focused on the potential intersections and collisions between culture and technologies, is in fact located in one of the main buildings of Galleria Vittorio Emanuele II in Milan. Built between 1865 and 1878, the Galleria is one of the best manifestations (on Italian ground) of the arcades that flourished in the 14th century all over Europe: at once an embodiment of state power, a form of urbanistic rationalisation, and gentrification of the city center; an example of commodification of public space; and an ideal site for flaneurship and voyeurism.

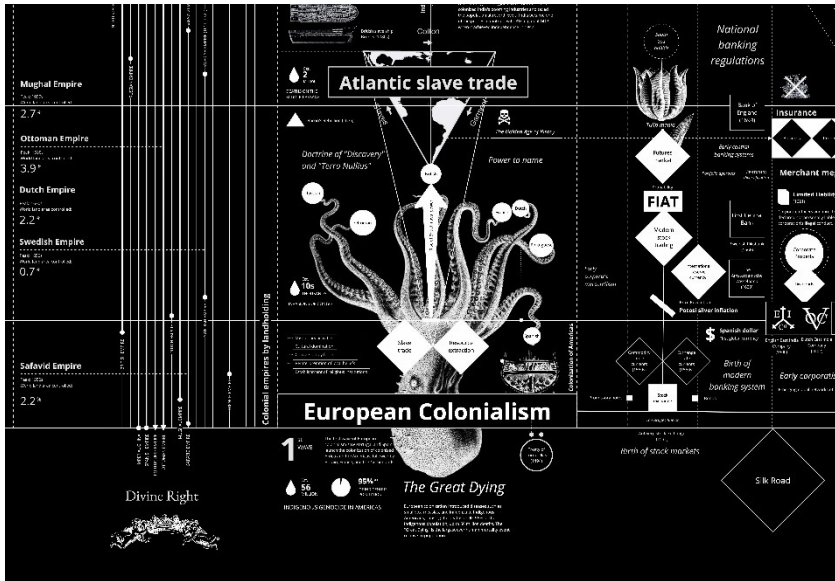
¹ Extending across the fifth and sixth floors of the building, right above the central octagon of the cross structure of the Galleria, Osservatorio offers a fascinating view of the glass and iron dome that covers the arcades – a sanctuary to the first industrial revolution turned into a set for our post-industrial speculations on the cultural impact of technologies.²



The exhibition borrows its name from the main project on show, *Calculating Empires: A Genealogy of Technology and Power, 1500-2025* (2024), which premiered at Osservatorio Prada and was contextualised through the presentation of previous outcomes of the research and artistic activity of the two authors. Kate Crawford is a leading scholar of the social and political implications of artificial intelligence and a senior researcher at Microsoft, with over twenty years of experience in the academic world and an impressive list of publications on related topics, both in journals and in popular newspapers and magazines. Her latest book, *Atlas of AI: Power, Politics, and the Planetary Costs of Artificial Intelligence* (2021), has been widely referenced in topics on the social, environmental, and political costs of AI, and for its ability to open new perspectives on its materiality and its relationship with colonialism, extractivism, and the surveillance strategies of late capitalism. Along with her research and academic career, Crawford has frequently advised policymakers in the United Nations, European Parliament, and the White House among others, and has collaborated in recent years with artists and visual researchers. This includes Vladan Joler, with whom she worked in 2018 on ‘Anatomy of an AI System’, a research paper and a visual rendering of the Amazon Echo ‘as an anatomical map of human labor, data and planetary resources’.³ A year later, *Training Humans* (2019) – her collaboration with artist and experimental geographer Trevor Paglen – premiered also at Osservatorio Prada, offering a timely exploration of the fields of

machine vision and machine learning (again supported by an open access research paper, 'Excavating AI').⁴

Based in Novi Sad, Serbia, Vladan Joler was trained as an artist and designer; since 2000 he is an Associate Professor at the New Media Department of the University of Novi Sad. In 2012 he co-founded the SHARE Foundation, with the goal to fight for the sustainability of an open, free, and decentralised internet and for the implementation of human rights standards in the digital environment. Since 2015, as part of the Foundation's activities, he coordinated SHARE Lab, an independent investigation group working with data visualisation and digital forensic methodologies to expose black box technologies. It is in the frame of SHARE Lab's investigations that Joler started developing his signature style of mapping, with projects like the series *Invisible Infrastructures* (2015),⁵ investigating the physical dimension of digital networks and the flow of information within them, and the trilogy *Facebook Algorithmic Factory* (2017),⁶ mapping and visualising the invisible exploitation process employed by the dominant social media platform to harvest, process, and monetise users' data. Using graphs and various visualisation techniques to make sense of large amounts of data and handmade illustrations to visualise complex concepts, SHARE Lab's investigations feature a distinctively minimal visual design, which allows the spectator to get an overall view of the whole structure without oversimplifying it; they turn complex systems into powerful images while preserving the granularity of the sourced information.



Introducing the visual essay ‘The Human Fabric of the Facebook Pyramid’, the latest entry in the SHARE Lab website so far,⁷ the collective situates their effort in a tradition that includes Mark Lombardi, the American conceptual artist that pioneered data visualisation as a medium, drawing handmade maps on paper that outlined complex interrelations between economic and political systems; Josh On’s *They Rule* (2001-ongoing),⁸ an online dynamic and interactive visualisation of the interlocking directories of the top 100 US companies; and the Paris-based artist duo Bureau d’études,⁹ who have been producing cartographies of contemporary political, social, and economic systems, usually presented in the form of large-sized murals. These references, along with the philosophical models (actor-network-theory, or ANT)¹⁰ and research methods borrowed from Bruno Latour and Uwe Krüger,¹¹ ‘give us a methodology that combines discourse and dispositif/apparatus analysis with the tools of art activism for (re)conceptualising and visualizing the results of our research’.

This methodology also informs *Anatomy of an AI System* (2018), Crawford and Joler’s first collaboration and the centerpiece on the fifth floor of Observatorio. The work, still extremely topical in the way it shows the extractivist nature of how AI systems turn their user into a sort of chimera, ‘simultaneously a consumer, a resource, a worker, and a product’, is exploded both in space and time, in a way that provides access both to the amount of

research that went into it, and to the outcomes it generated. The exhibition starts with Simon Denny's *Document Relief 1, 3, 22 (Amazon Worker Cage patent)* (2019-20), a small paper sculpture directly inspired by an Amazon patent revealed by Crawford and Joler's research, portraying a potential way to automate work management in the Amazon warehouse, and a powerful visualisation of the 'human in the loop' metaphor, demonstrating how the myth of automation is still rooted in systems of exploitation and extraction of human labor. It goes on with the map and essay, followed by the projection of Joler's solo work *New Extractivism* (2021),¹² a map and a voice-over animation that further develops the concept of extractivism in current technological systems, taking off from where *Anatomy of an AI System* stopped and paving the way to *Calculating Empires*. Finally, the display includes an exploded view of the Amazon Echo; a collection of technological patents; a work by SHARE Lab on how packets of information travel through the network, presented as a collection of slides; and a mineral collection presenting samples of the rare, and often toxic, minerals used to produce conductors, microchips, and batteries, demonstrating the usually invisible, globalised extractive economies that feed these apparently immaterial systems, with a focus on their geographical distribution.

As the gallery leaflet points out very clearly, while *Anatomy of an AI System* is about space, *Calculating Empires* is about time – the deep time of the media,¹³ technology, and power – offering 'a genealogical countermeasure to the current technological presentism'.¹⁴ As we ascend the stairs to the sixth floor, we first encounter the small door that allows us to enter the Calculating Empires Map Room: a black parallel-piped structure built for the occasion, which sees the map unfurl around the viewer for 24 linear meters on the two longitudinal walls. The installation evokes in a rather transparent way two visual metaphors: that of the black box, 'an opaque technological device for which only the inputs and outputs are known',¹⁵ now a common metaphor to describe the impenetrability of contemporary technological systems, which hide the ways of their operation under layers of corporate secrecy and technological complexity; and that of the codex, in this case a parchment scroll, that throughout history has proved to be an extraordinary tool not only for storytelling, but also for articulating the laws on which the ruling power is based.

The map explores ‘how technical and social structures co-evolved over five centuries’, and ‘offers a means of seeing our technological present in a deeper historical context’¹⁶ by centering on four themes: communication, computation, classification, and control. It is divided in two equal parts and structured on two axes: the vertical axis, representing time; and the horizontal axis, featuring a collection of systems, from communication devices on the far left to military systems on the far right.

As the viewers exit the Map Room they enter a second section of the display in which – similarly to what happens on the fifth floor – the research sources that nurtured the project are exploded in space. More specifically, the display is articulated into a wunderkammer including 58 items: books, historical maps, devices and inventions from the last six centuries, illustrating some of the systems outlined on the map (spanning from computer punch cards to anthropometric cards, from stroboscopic discs to IQ test kits, from Edison’s wax cylinders to silicon wafers, from Georgius Agricola’s *De re metallica* to a Soviet cybernetics book); and a small library featuring about 30 reference books.

My first reaction to the show was that it was overwhelming; too much information to fit along a typical exhibition visit, too much content to process in a few hours, let alone in a few minutes, with phones vibrating in our pocket and other humans distracting us from immersion in this continuous flow of information. The artists could have found a more linear and discursive way to provide access to all this content with the realistic expectation that we can take some of it back home with us – like the animated voiceover or New Extractivism, for example. Until I realised that, in *Calculating Empires*, excess is not a bug but a feature, and a medium.

The artists are keenly aware of this, as the short essay accompanying the project in its online manifestation, launched in June 2024, demonstrates. Overwhelming is the first emotional reaction they want to get from us. They do not want to make complexity simple and digestible; they want to prepare us to deal with it. They write:

The contemporary tendency toward simplification and solutionism has weakened the ability to handle dense information, while our technical and environmental realities only become more complex and interdependent. By visualizing these inter-

laced histories of empire in intricate detail, we hope to better understand our current predicament. In the words of French historian Fernand Braudel, ‘if one wants to understand the world, one has to determine the hierarchy of forces, currents, and individual movements, and then put them together to form an overall constellation.’ *Calculating Empires* invites the visitor inside this constellation.¹⁷

This assault on simplification and solutionism is shortly followed by an invitation to autonomy and slowness:

Every reading of this work is different, and you’re invited to draw your own connections. Hundreds of individual drawings and texts span centuries of conflict, enclosure, and control. We suggest taking your time and reading slowly – a radical act in an era of speed and simplification.

As with every map, it is up to us to find our path through the space it describes in detail; the only suggestion the cartographers can give us is that this is a map for walking, not for running, driving, or flying over the territory. To properly experience this time panorama viewers have to prepare to move slowly through the space, zoom in and out, stand still in front of a line of text or sit down on the benches provided at the center of the installation to have a second look at the overall picture – and resist distraction. It does not fit the ‘disordered attention’ model recently discussed by Claire Bishop as the main mode of contemporary spectatorship; like the models it references – the map, the codex, the panorama – it still requires the ‘fully focused presence and deep attention’ of modern spectatorship.¹⁸

Another criticism that could be made regarding Crawford and Joler’s effort is that maps themselves are tools of domination. The first cartographers were colonialists. To know a territory is to control it. The history of cartography is a history of conquests, wars, employing the most sophisticated measurement, surveillance, and vision technologies to transform the open and unknown space of discovery into the closed, simplified, quantified, and transparent space of control.

¹⁹ Awareness of this emerges through their essay, and in the map as well: a whole portion of it focuses on ‘how mapping and architecture are themselves systems of control’. Even their own visualisation systems are placed under scrutiny:

visual illustrations have shaped the conceptual horizons of the scientific imaginary. We use the same method to show how technology is political, not separate from it. Even diagrammatic representations – from the Gantt chart to the logic gate – are forms of organizing information which embed a political structure.

However, there is no easy way out of this incorporated bias: the way Crawford and Joler have envisioned to hand over to the viewer / reader / time traveler the power they gained through mapping and visualising is to leave them free to navigate the environment, without a prescribed route, entry, or exit points.

If you want to go anywhere, find a map. *Calculating Empires* is anomalous in this respect, as the territory it maps is not the territory it guides us through. It rather maps the past to allow us to find a way through the future, hinting at a conception of time that appears to be stratified and deep (see Zielinski 2006). Moreover, it offers us a model of the existing realities as a tool to start imagining new ones. These serve as an escape route from the ‘overwhelming now’, compiling, in the words of philosopher Federico Campagna, an ‘overmorrow’s library’ to save to survive our uncertain future:

The technologies of today are the latest manifestations of a long line of entangled systems of knowledge and control. This is the purpose of our visual genealogy: to show the complex interplay of systems of power, information, and circumstance across terrain and time, in order to imagine how things could be otherwise [...] As the overwhelming now continues to unfold, *Calculating Empires* offers the possibility of looking back, in order to consider how different futures could be envisioned and realized.

To conclude: *Calculating Empires* successfully counters the hegemonic narrative of digital technology as the harbinger of the new, rooted in the present and shaping the future, by simultaneously turning the perspective of media archaeology into a masterful historical fresco and a disposable map, and by refusing to adapt to the conditions of spectatorship imposed by the distracted present,²⁰ and pursuing modernist depth and slowness instead of distraction and frenzy. Like in media archaeology, the past is portrayed as the material and

ideological source of contemporary technology, revealing the hidden layers of media development as a way to reach a more complex and nuanced understanding of their impact on current reality (see Zielinski 2006 and Parikka 2012, 2016) – but also as a resource we have to dig deep through in order to rediscover and refine the experiential and conceptual tools we need to access the present and envision alternative futures.

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Notes

¹ As famously outlined by Walter Benjamin in his 1935 essay 'Paris, the Capital of the Nineteenth Century', by drawing a connection between Fourier, Daguerre, Haussmann, and Baudelaire (Benjamin 1999).

² An environmental and atmospheric suggestion that resonates with the many attempts by recent developments in

media (Galloway 2021; Crawford 2021; Pasquinelli 2023) and visual studies (Crary 2001; Mirzoeff 2011), and, as

we will see, beautifully portrayed in *Calculating Empires*, to find the roots of contemporary technologies and AI in

the science and technology of the late 14th century.

³ See <https://anatomyof.ai> (accessed on 8 July 2024).

⁴ See <https://excavating.ai> (accessed on 8 July 2024).

⁵ See <https://labs.rs/en/category/invisible-infrastructures/> (accessed on 8 July 2024).

⁶ See <https://labs.rs/en/category/facebook-research/> (accessed on 8 July 2024).

⁷ See <https://labs.rs/en/the-human-fabric-of-the-facebook-pyramid/> (accessed on 8 July 2024).

⁸ See <https://theyrule.net> (accessed on 8 July 2024).

⁹ See <https://bureaudetudes.org> (accessed on 8 July 2024).

¹⁰ ANT is an approach to social theory claiming that everything in the social and natural worlds exists in constantly

shifting networks of relationships. First developed at the École nationale supérieure des mines de Paris in the early

1980s by staff and visiting researchers including Bruno Latour and John Law, it later became a backbone of Latour's

social theory (see Latour 2005).

¹¹ Research assistant in the Department of Journalism at Leipzig University, Dr. Uwe Krüger has been using network

analysis in his studies on the influence of political and economic elites on the media (Krüger 2019).

¹² See <https://extractivism.online> (accessed on 8 July 2024).

¹³ This phrasing is borrowed from the title of Siegfried Zielinski's seminal book *Deep Time of the Media*, a

foundational text in the field of media archeology (Zielinski 2006).

¹⁴ Crawford and Joler, 2023.

¹⁵ Galloway 2021.

¹⁶ Crawford and Joler, 2023.

¹⁷ Ibid.

¹⁸ Bishop, 2024.

¹⁹ These connections have been widely explored, spanning from Bernhard Siegert's contextualisation of grids as cultural techniques for 'ruling space' (Siegert 2015) to Svetlana Alpers' notion of the 'mapping impulse' (Alpers 1983) to Teresa Castro's analysis of 'cartographic shapes' (Castro 2009); to recent studies on the drone's view (Gregory 2011) and to Ana Peraica's theorisation of the 'total image', merging landscape photography and mapping in a new, layered, totalising picture of the world (Peraica 2019).

²⁰ Rushkoff 2013.