MedCrave
Step into the World of Research

International Robotics & Automation Journal

Review Article

Open Access

CrossMark

The performative idiom and the post-utopic

Volume 4 Issue 5 - 2018

Alexander Webb
School of Architecture, George Pearl Hall University of New Mexico, Mexico

Correspondence: Alexander Webb, School of Architecture, George Pearl Hall University of New Mexico, Mexico, Tel 5053124748, Email awabb4@unm.edu

Received: October 16, 2018 | **Published:** October 24, 2018

Introduction

The cities of the future will not be for us, anymore than the internet is for us. In 2014, there was more bot traffic on the internet- scrapers, scammers, and impersonators- than human traffic.[1] The internet was not intended to become a platform for software to software communication, but it has evolved into a rich ecology of chattering bots, low-grade machinic intelligence interfacing with low-grade machinic intelligence. As urban media is increasingly more adopted, apps, scripts and software will likely drive urban experience as much as public space, infrastructure and transit. In facilitating human needs the network will likely facilitate machine to machine communication as well. Networked technology expands the users of the city to a broader range of species. If the city of the 20th century removed microbiotic bacteria from the urban fabric, the 21st century will introduce species from the machinic phyla. The city will inherently become less oriented around the human, if not more post-human in the sense of moving beyond an anthropocentric ontology.[2] This is not necessarily detrimental- though bot traffic is generally considered a nuisance, almost half of the bot traffic recorded in 2014 was considered beneficial. Beneficial bots investigate websites for search engines, support RSS feeds, and provide real time updates for weather, news and sports sites.[1] These machinic agents effectively collect information on the web and consolidate, index, and organize it. Much like the incorporation of probiotics in human nutrition has demonstrated, it is overly simplistic to describe an entire taxonomic domain as "bad," and we should not make the same mistake with the machinic phyla. As this article will suggest, embracing machinic intelligence could have radical impacts upon our urban and global metabolisms. The role of urban computation is inextricably linked to Big Data. When designers and engineers have been faced with the task of collecting the information a city produces, they have been stymied by sheer volume of information. According to Santa Fe Institute researcher Luis Bettencourt, using data to predict the city is extremely computationally taxing; calculating the number of computational steps for one intervention in a city of a million people is roughly ten to the power of six times ten to the power of six.[3] Though it may be unfathomable, we need to consider the possibility that our cities may easily both require and produce more information than is currently archived on the entire internet. If this is the case, then the question should be how to construct a networked city that leverages machinic intelligence- bots and otherwise- to help consolidate, index, organize, curate and edit it. A post-human city may not simply be reflective of a contemporary condition, it may be a necessary strategy for cities to respond to contemporary global issues.

Yet many current deployments of urban scale artificial intelligence (AI) are structured in a way that may prevent benefiting from an incorporation of the machinic. The hierarchical organization of the sensor-based Smart City, such as Songdo and Masdar, are focused around central server banks that create logjams of information. To date, the sensor-based Smart City is remarkably unresponsive to the information it does collect, struggling to actualize the information it receives.[4] These cities are trapped within their own classification and organizational models, the anthropocentric bias of their designs restraining machinic intelligence to a subservient role. Understanding how urban scale AI could be reframed is an abstract exercise and inherently difficult. Discussions regarding the utopic vs the post-utopic as a metaphor are a helpful starting point, in that they directly address the structures and organizations of the design of a city or polis. The Smart City model, as realized by Songdo and Masdar City, can be understood as utopic in its design approach, if not in its aspirations. The sensor-based Smart City is rationally ordered, pre-determined model that its citizens then adhere to. A post-utopic approach, embracing behavior and performance over models, is productive when designing networked urban infrastructure. As much of the criticism of the Smart City is in its obsolete design approaches, examining a post-utopic framework is productive in creating a strategy for a more responsive and inclusive urban scale AI.

The goal in this paper is not to question notions of utopia through an investigation of the post-utopic, but to use a post-utopic framework as a mechanism for understanding urban organizations through networked technology and artificial intelligence. Here the utopic and the post-utopic will be viewed more as design approaches than ideologies, the utopic embracing the model and the post-utopic the practice. This distinction is supported by a variety of sources. In Utopia and its Enemies, George Kateb describes utopia as a model- an incredibly varied model, as it responds to context, but a model that is implemented upon a context.[5] Kateb suggests that the difficulty of adopting a utopic platform is the transition, not developing an effective model- the models, if adopted, are already effective.[6] In Utopias: A Brief History from Ancient Writings to Virtual Communities, Howard Segal builds from Kateb's definition to highlight the importance of technology, particularly as it relates to resource use, as a critical element of the utopic ideal.[7]

Existing literature

Urban scale AI as a concept is inherently dependent upon digital technology. As there has been little written on the specific relationship between urban scale AI and utopic concepts, this paper will build upon previous work that examines overlaps between digital technology, utopian and post-utopian concepts. This literature can be understood in two groups: historians and political scientists examining utopia and observing utopic opportunities or trends as enabled by digital technology, and architects and computer scientists who are looking at digital communities and observing utopic tendencies. Segal, in the aforementioned Utopias: A Brief History from Ancient Writings to Virtual Communities, touches upon the capacities for social media and online communities to achieve utopian ideals.[8] In both

descriptions, however, Segal views the technology as an escapist alternative to physical space, and does not describe a capacity for these technologies to enhance social structures and ideas outside of cyberspace. Martijn de Waal attempts to describe how technology can be used to augment different notions of a city in The City as Interface: How New Media Are Changing the City. De Waal acknowledges a capacity for digital technology to serve a utopian model, what de Waal terms the "Communitarian city," where residents share the same way of life.[9] He also notes that the majority of urban media supports the view of the city as a marketplace with no social responsibility to the community or polis.[10] Yet de Waal is more interested in how digital technology can serve a different model, what he terms the "Republican city" where residents may choose divergent ways of life but share responsibility for the city as a whole.[10] Kazys Varnelis and Anne Friedberg describe the simultaneous inhabitation of geo-physical and digital space in "Place: The Networking of Public Space," but do not investigate utopic or other social implications.[11] Saskia Sassen describes the potential of networked technology to inform urban space and gain a more egalitarian, if not utopic, degree of agency within their community in "Open Source Urbanism".[12] William Mitchell warns of how networked technology could lead to a dystopic, global panopticon in ME++'s chapter "Logic Prisons".[13] Merlyna Lim and Mark E. Kann issue a similar warning in "Politics: Deliberation, Mobilization, and Networked Practices of Agitation," suggesting that networked communication does not contribute to the democratic enhancement of a political system.[14] While these warnings are warranted, an assumption of this paper is that the potential abuses of Big Data, though very much legitimate, are best addressed through means other than architectural and urban design. As the collection and deployment of Big Data are relatively nascent, this paper assumes that the potential privacy issues associated through networked technology will be addressed by other disciplines.

The model and the practice

In "Utopian and Post-Utopian Paradigms in Classical Political Thought", Ryan Balot describes the implications for humanities scholarship post-utopia. If we are to understand utopia as Balot describes, a rationally ordered society that aims at social unity, then this definition poses significant challenges if the model is viewed as flawed. The traditional responses to a fall of utopia, according to Balot, are either to seek new models of utopia or to abandon the concept altogether.[15] Rather than choose one of these two responses, Balot suggests that investigating the method through which utopia was deployed, rather than the ideals it represents, as a course of action. Balot uses Socrates as example of the post-utopic, writing: "...Socrates doesn't know what utopia looks like, but he knows how he should live: through endlessly pursuing an understanding of human good, as it benefits a human being".[16] In essence, to Balot post-utopian thought is an avoidance of a totalizing answer, a model that one look at, and the acceptance of an introspective method of self-improvement. When applied to a design strategy or method, Balot's suggestion becomes problematic. An inherent component of design is the imposition of a design product or strategy upon a client or community. Upon an initial review, Balot appears to be opposition to any design process- creating a disconnect between an internal focus and a designed product. While it is possible to understand Balot's suggestions as a form of virtue ethics, it may be more productive to view Balot's distinction between a utopic strategy and a post-utopic strategy as the difference between a model and a practice. Utopian thought is traditionally presented as a prescriptive model to be adhered to by its constituents. If the model is not complex or adaptive enough, more complex and more adaptive models are created as a result. To Balot, post-utopian thought is the understanding of a behavior, a sense of things rather than an objective understanding of them, and a rejection of European rationalism as a mechanism for understanding and deploying utopia.[17] If a model and a practice can be understood as different ways of knowing, this understanding is also demonstrated by comparing the discipline of cybernetics to other scientific fields. In The Cybernetic Brain, Andrew Pickering suggests that the hallmark of cybernetics, particularly British cybernetics, was a refusal of the detour of knowledge, a primary concern of performance as performance and not of performance as representation.[18] Cyberneticians, such as Ross Ashby and Stafford Beer, were interested in how systems performed directly, and not attempting to "know" as system to anticipate how it would perform. An example of this method is the Black Box concept used in electrical engineering, where the Black Box is a device with inputs and outputs, and no indication of its inner workings. Engineers work with the inputs and outputs to understand the box through its behavior. Cybernetics expanded this method of understanding components in a system to groups of components or an entire system itself. In cybernetics, performance is optimized through sensing and feedback.[19] In this context, knowledge is a mechanism of prediction, but, in the context of urban systems and sociological structures, the dynamics are so complex that they resist attempts to represent them. The juxtapositions of performance and behavior against simulation and modeling is recurrent in Pickering's work. In The Mangle of Practice: Time, Agency & Science, Pickering describes the importance of behaviors, and we should see science as an extension of "the business of coping with material agency".[20] Pickering describes this way of knowing as the performative idiom, a method of understanding through the understanding of a behavior. The performative idiom is suggested an opposition to the representational idiom, where knowledge is obtained by through the acts of modeling and simulation. Pickering suggests that it is not necessary to eliminate the representational idiom, but simply to allow more scientific production to follow the performative idiom. If architectural and urban design are to effectively adapt to a post-utopic and post-human framework, they both need to adopt strategies that privilege the performative idiom. Both Balot and Pickering describe approaches that are productive for design within an urban context. The sheer amount of information has stymied understanding an urban condition through computation and a European rationalist approach; and while this is not enough evidence to conclude that the performative idiom is productive, there are many suggestions that this framework is both effective and efficient when dealing with urban complexity.

Disposition

The discussion of designing in response to the performative idiom as opposed to the representational idiom is an active discussion within architectural and urban design as well. The model as a design concept, dominates the design process of both disciplines, anchoring aresponse to the representational idiom.[21] Architectural and urban organization are contingent upon simulation and the model to serve as a guide towards an evaluated and predetermined result. The model serves as a framework, a lattice from which form can grow, simulation provides testimony that the form will perform. Though less clear in architectural design, the inconsistencies of use of the representational idiom are apparent when dealing with the complexities of urban and infrastructural space. In Extrastatecraft: The Power of Infrastructural Space, Keller Easterling describes a design strategy that embodies

the performative idiom. Easterling describes the immobility of infrastructure space, apolitical districts that resist forces of a population and are borne of the corporate interests of multinationals. Extrastatecraft largely describes the design opportunities with Free Zones, de-legislated areas constructed to promote international trade.[22] Easterling identifies the largely immobile, massive infrastructural spaces that are birthed from enormous economic engines- frequently the realm beyond which a design team could have an impact.[23] The legislative, economic, and corporate forces that have engendered these spaces are beyond the realm of comprehension or intervention for standard design approach. Designers are frequently relegated to working with "skin jobs", dressing-up projects that are otherwise designed. As an alternative to fully understanding all of the proformas and complex political relationships, Easterling suggests the understanding of a context's disposition be deployed by a strategy of hacking. Easterling writes, "When navigating the complex dispositions of a river, dimples or ripples on the water serve as markers; and when navigating or hacking the complex dispositions of infrastructure, some simple markers are equally useful. The infrastructural operating system is filled with well-rehearsed sequences of code… Hacking into it requires forms that are also like software".[24]

Though described through the lens of infrastructural design, this approach is particularly useful for urban design as well. As cities equip themselves with more hardware and networked infrastructure they engender a capacity to be designed through software itself, as opposed to software as analogy for a formal construct. The various compositions of the mechanical cranes of West 8's Schouwburgplein were never computed, but the mechanical interface enables a responsiveness and interaction, a capacity for the design to respond directly to the disposition of the city. If disposition can be understood as "knowing how" instead of "knowing what", many data-driven urban designers are conducting their investigations in the opposite approach.[25] Space Syntax delineate their rationalist approach in their firm's slogan, "Science Based : Human Focused".[26] MIT's City Form Lab states in their video "Urban Network Analysis," "A complex built environment (city) can be reduced to three basic elements: links… nodes.. and buildings…"[27] The video suggests that the social dynamism of a city can be understood through these geographic elements.[28] However, this assertion is somewhat problematic. Many cities- the city of Detroit being one of them- have endured tremendous change in their social dynamics in recent years while these geographic elements have remained static. Both of these approaches are attempts to understand urban contexts through a rationalist approach, but deconstructing a complex system into discrete elements. Predictive modeling an entity as complex as an urban environment forces reductivist, overly simplistic strategies for summarizing a city in several critical variables. This is a necessary component of what Pickering would describe as a detour of knowledge, rather than focusing directly on performance as performance. Rather than attempting to rationally understand a context to then design for it, following the descriptive idiom, designs may respond to their context directly. A design strategy that adopts the performative idiom, or responds to the disposition of the city, should be rapidly prototyped and evaluated to gauge its level of performance and improved upon. This approach embraces an idea of initial failure, but quickly improves their response and integrates even more effectively with the context. Viewed with this framework, geospatial smartphone apps have been far more effective at working with a city's disposition and responding to a performative idiom than architecture and urban design.

Apps like Foursquare decode and organize the city as it already exists.[29] Foursquare indexes places within an urban context, and encourages people to check-in to these places. Their location can be broadcast via Foursquare or other social media, allowing the user to communicate via the media of place. Places are constantly updated as they expand or dissolve, users can broadcast a place's demise or creation. The communication of the popularity or other aspects of a place may be broadcast via Foursquare, either extending or shortening the place's lifespan. Foursquare is not so much a response to the disposition of the city, as an integral component of it. If the sensor-based Smart City, as in Songdo and Masdar, are focused upon collecting data to create a more detailed, more productive representation, then apps like Foursquare are focused on performance: an engagement with a populus and its context directly, without an interest in describing the context through a simulation. The importance is how the apps enable behavior, not collecting all evidence of behavior and determining what to do from it. These apps are social in nature- a critical component of urban behavior- but only one aspect of urban life. While dynamic, socially rich cities encourage a global urbanization; there are other aspects of cities that could be addressed as well. If Balot is suggesting that the post-utopic is not a critique on ideals of utopia but simply its methods, then post-utopic design strategies should respond to all aspects of utopia. Segal's insight into the technological role within utopias seems particularly useful, as the opportunity to develop social communication tools could promote a more sustainable infrastructure as well. Apps that deal with resource use, transit, and food distribution could also be productive. Apps that truly engage with the disposition of the city will be social, but also infrastructural and spatial (Figure 1).

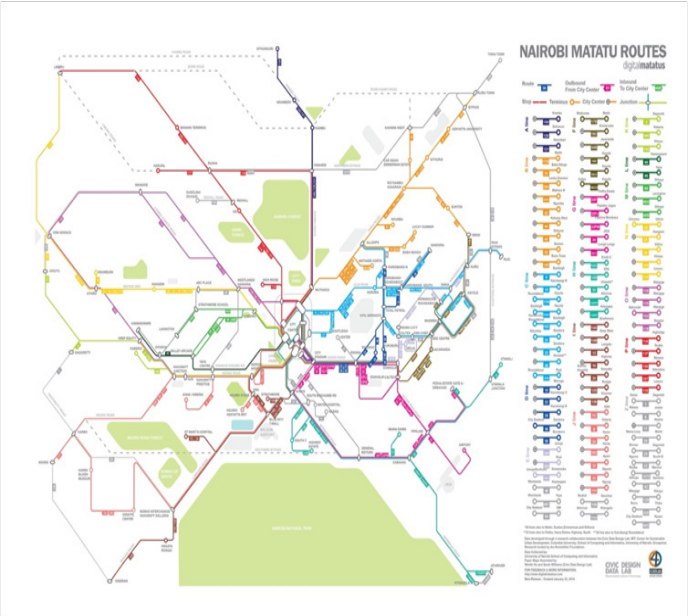

Figure 1 Digital matatus by the civic data design lab at MIT, center for sustainable urban development at Columbia University, c4d lab at the University of Nairobi, and groupshot.

The importance of action

Digital Matatus, a project led by Sarah Williams and Jacqueline Klopp, is an interesting blend of social, infrastructural and spatial performance. The project used cell phones as sensors to locate informal bus routes in Nairobi. Nairobi's Matatus is a large network of mini-buses that was largely unaccounted for by the city. Before the

project was deployed, the City Council could only identify 90 of the approximately 130 routes.[30] The cell phones served as tracking devices for the matatus, recording their routes which were then synthesized by Williams and her team at MIT's Civic Data Design Lab. Williams worked with the University of Nairobi to develop an application that would work with the local hardware and network, translating Matatu stops into GTFS protocols.[28] Students from the University of Nairobi either rode the Matatus themselves, or followed the Matatus through dangerous neighborhoods of Nairobi in private cars, recording their geo-coordinates on their phones.[28] The mappings created by the project would be used by the United Nations to suggest Bus Rapid Transit plans for the city.[28] With Digital Matatus, the cell phone serves a similar purpose as the constructed sensor array- the harvesting of data to help understand aspects of an urban condition. The sensors deployed by the users provides a cheaper, but still effective substitute for the Cisco-created sensor-laden urban fabric of the Smart City. The cell phones provide significant information, and document an organic, grassroots system that allows more users to participate with the Matatus. When one considers that cell phones are increasingly geo-located, one has to question what would be more effective- building a ubiquitous sensor array, or simply distributing smart phones to those who do not have them. In this sense, the Matatus operate as a networked system- a system whose complex responses to ridership was opaque, preventing riders to participate. The use of computation serves as a lens to understand a complex system, to network with the information it provides, but does not participate with it directly. The intelligence is located within the system itself, computation simply provides a window to access the infrastructure. The project is an integration with Nairobi's disposition, but responds to issues of resource use and efficiency, while enabling the social aspects of ride sharing. Digital Matatus is a method of tracking a component of the city to allow participants to interface with it. Rather than determine a model of an ideal transit system for Nairobi and implement it, Digital Matatus allows the intelligence of the Matatus drivers and the populus of Nairobi to respond to construction, events, and traffic patterns. In this sense, Digital Matatus is allowing the transit system determine how it should perform in the same way Socrates "knows how to live." The system itself is engendered with a degree of agency, and becomes a vital manifestation of performance within the post-human city. The added layer of computation enables a capacity for users to interface with the system and make it that much more efficient (Figure 2).

Figure 2 The city of Chicago's array of things, the urban center for computation and data.

Though it may be more intuitive to understand how computation can help transit design respond to the performative idiom and the disposition of a city, the mechanical components of transit allow for quick responses to computational input, the same approach may be used to design other aspects of a city's infrastructure and space. The City of Chicago's Array of Things (AoT) has embedded the first of 500 sensor nodes throughout the metropolis, sensors that will collect information regarding air and surface temperature, barometric pressure,

light, vibration, carbon monoxide, nitrogen dioxide, sulfur dioxide, ozone, and ambient sound intensity.[31] Two cameras will collect data on vehicle and foot traffic, standing water, sky color, and cloud cover. The project intends to make all of this information open and accessible, and no information will be personally identifiable.[28] AoT is a critical step towards a robust urban scale AI, but a sensor array only collects data to create a representation. To be post-utopic, AoT should include actuators- mechanical components that have the capacity to respond to data they collect. To respond to an idiom of performance, cities need the environmental equivalent to matatus, components that can mechanically respond to direct airflow, mitigate sound, sunlight and rain. Providing hardware plugs, hardware equivalents of open source data embedded into an urban fabric, that connect to infrastructure could provide the capacity to prototype and iterate solutions and interventions more quickly. Providing open source infrastructure effectively crowdsources the architecture of the city, allowing the populous to rapidly adapt and adjust to changing conditions and environments. Clearly this strategy poses questions of oversight and quality control, but community sourced coding has developed strategies for similar conditions. The more challenging issue is that of authority, as it is unclear if municipal organizations would cede their dominance over the formal conditions of urban infrastructure and space and enable their communities to drive their infrastructure directly. Arduino microcontrollers present an opportunity to rapidly prototype these sorts of actuators. Dontflush.me is an Arduino-based prototype that senses New York City sewage flow, and alerts residents via bathroom-based light bulbs that they should not flush their toilets when the sewers are overloaded by rainfall.[29] Created by a NYC resident, dontflush.me describes the power of microscale infrastructural interventions, and demonstrates the capacity to network actuators to respond to a change in a city's disposition. The Arduino chip allows high degree of rapid prototyping, ease of use, and low cost that facilitates guerilla-style urban infrastructure design.[32] When combined with the possibilities of apps and Arduino prototypes, the AoT appears to be a productive model for urban scale AI that responds to ideas of performance. AoT's strength is in its distribution, which can effectively track many goals of a technological utopia across the urban fabric. If the AoT's sensor stations were extended to act upon the information, or if there was a linked network of actuators, then the array could have the capacity to respond to the disposition of the city and avoid only creating a representation.

Conclusion

If the post-utopic can be understood as a practice instead of a model, then designing a response to the post-utopic necessitates a shift in methodology and product. Designs should be reflexive and adaptive, demonstrating aspects of the city instead of impose themselves upon it. Design products should be dynamic and responsive, adapting to the shifting disposition of a city and enabling productive degrees of performance. If the post-utopic privileges behavior, then the way in which designs perform should be the primary criteria of evaluation- in terms of environmental, energy and social performance. It is arguable

that in principle, a post-anthropocentric ontological landscape requires that the degree of agency that is afforded to humans should be extended to non-human entities as well. This would require that machinic intelligences be granted a degree of autonomy, and viewed as partners within an urban landscape. By endowing machinic components a capacity to respond directly to various conditions we are leveraging their computational strengths in ways that might enhance transit, air quality, and other conditions. By empowering urban scale AI with a larger degree of autonomy, we are liberating it from the restrictive models of the utopic, which concretize the machinic phyla in a subservient role. Ultimately, empowering urban scale AI with more intelligence is not only a reflection of the post-utopic, but serves us well as a species. Big Data has promised to give us a greater understanding of the city, but we have failed to leverage its insight to date. By deferring the role of understanding the city to the machine, we will avoid the detour of knowledge and focus directly on what we need most from our cities- performance.

Acknowledgements

My Institute's UNM representative is fully aware of this submission.

Conflict of interest

The author declares there is no conflict of interest.

References

1. Zeifman I. 2014 Bot traffic report: just the droids you were looking for. 2018.
2. De Landa M. 1000 years of war: CTHEORY interview with manuel De Landa. *CTheory*. 2003;5−1.
3. Bettencourt LM. The uses of big data in cities. *Big Data*. 2014;2(1):12−22.
4. Gökçe Günel describes shortcomings of one such Smart City, Masdar City, in her article for the ARPA Journal. Masdar City's Hidden Brain. 2014.
5. Kateb G. Utopia and its enemies. The Free Press of Glencoe; London, UK. 1963:5.
6. Ibid. 21.
7. Segal HP. Utopias: a brief history from ancient writings to virtual communities. *John Wiley & Sons*. 2012;47:6−7 & 50−53.
8. Ibid. 193–194,198,199.
9. Waal M. *The city as interface: how new media are changing the city*. nai010 publishers: Rotterdam; 2014:10,11.
10. Ibid. 10.
11. Varnelis K, Friedberg A. *Place: the networking of public space. Networked Publics*. In: Varnelis K. editor. The MIT Press: Cambridge; 2008:15−42.
12. Sassen S. *Open source urbanism*. Domus. 2011.
13. Mitchell WJ. Me++: The Cyborg self and the networked city. MIT Press, Cambridge; 2004;189−211.
14. Lim M, Kann ME. Politics: deliberation, mobilization, and networked practices of agitation. Networked Publics. In: Varnelis K, editor. The MIT Press, Cambridge; 2008:77−107.
15. Balot Ryan K. Utopian and post-utopian paradigms in classical political thought. *Arion: A Journal of Humanities and the Classics*. 2008;16(2):75−90.
16. Ibid. 87.
17. Ibid. 77.
18. Pickering A. *The cybernetic brain: sketches of another future*. University of Chicago Press; 2010:21.
19. Townsend AM. *Smart cities: big data, civic hackers, and the quest for a new Utopia*. WW Norton & Company. 2013;75.
20. Pickering A. *The mangle of practice: time, agency, and science*. University of Chicago Press; 2010:6−7.
21. Ibid. 7.
22. Easterling K. *Extrastatecraft: the power of infrastructure space*. Verso Books; 2014:25−69.
23. Ibid. 71−73.
24. Ibid. 72−73.
25. Ibid. 81−82.
26. *Space Syntax|science-based: human-focused*. 2017.
27. *Urban network analysis. City Form Lab*. 2012.
28. Ibid.
29. Townsend AM. Smart cities: big data, civic hackers, and the quest for a new Utopia. WW Norton & Company. 2013;139−145.
30. Williams S. *Digital matatus: using mobile technology to visualize informality. Proceedings of the ACSA 103rd Annual Meeting: The Expanding Periphery and the Migrating Center*. 2015:1−5.
31. Mitchum R. *Chicago becomes first city to launch array of things*. 2016;773:484−9890.
32. Ibid. 137−141.