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- 1 This issue sets out to question the digitalization of space, covering a wide range of operations carried out today with the help computing devices. This term thus encompasses visualization, modelization, experimentation and projection operations for architectural, urban and landscape practices.
- 2 Here it is useful to reflect back upon the notion of apparatus which, according to several authors, from Michel Foucault to Bruno Latour and Michel Callon¹, demonstrates arrangements between heterogeneous elements, action and design procedures as well as configurations of human and non-human actors (objects and tools). Considering the digitalization of architectural, urban and landscape spaces from this angle calls for a reflection of the whole. If digital transition is one of the key words in public policy that the city, architecture and landscape architecture cannot escape, it is up to researchers to envision how this transition will be put in place, what sorts of expectations will it create and which effects it can lead to.
- 3 Resonating with the narratives surrounding digitalization in design and planning processes, we proposed three areas for reflection in the call for papers. The first is with regard to the ways in which architecture, cities and territories are visualized and “editorialized”; the second is about parametric and formal experimentations of space and the third concerns the impact of digital tools on the organization of work.
- 4 The first area for reflection, “Digital Visibility of Territories and Design”, examines the implication of networks and virtual spaces (Internet, GPS, Facebook, GIS, etc.) in ways of experimenting, producing and communicating space. We hypothesize that networks and virtual spaces participate today in the creation of original narratives in order to valorize buildings, territories, urban policies and planning initiatives. The second area for reflection, “Experimentation, Representations”, reflects upon the ways in which digital representations suggest forms and concepts to architects and spatial designers, perhaps exerting an influence on design project teachings, especially in processes that bring together parametric modelling experiments for architectural and urban space in the era of Big Data. With the coming of Building Information Modeling (BIM) and tools

of “smart cities”, the final area of reflection, “Organization of Design Work”, thus observes the eventuality of a new normativity that investigates its margins of freedom.

- 5 With the term “digitalization”, many authors responded without granting attention to the hypothesis put forth about a reconfiguration of “expected horizons” of architecture, the city and landscapes², with the coming of new information and communication technologies. Some authors have expressed a belief in a digital revolution, reinforcing dogmatic stances in architecture and urban planning, while others have discussed new projection systems in a highly technical framework. The selected contributions emphasize investigations, experimentations and ambivalences that provoke the emergence of digitalization within areas of study dealt with in this review. They reflect the activities of research laboratories in French schools of architecture, while simultaneously responding to a readjustment of ways of doing. From them, we note several trends.
- 6 A first trend is the integration of fabrication and spatial management logics within design strategies. Digital apparatuses do not necessarily bring about an escape from reality, and an entry into perfectly virtual and a-contextual spheres, as some might fear. They foreshadow increasingly performant exchanges between approaches to the design, fabrication and management of space. Prototypes, the use of full-sized models on spatial construction sites, 3D printers, etc., attest to a desire to consolidate ideas from the planning and design phases, rendering the boundaries between approaches more fluid.
- 7 On another note, hybridization forms of physical and digital realities also emerge. These hybrid realities (the installation of sensors in public space, interactive building facades, etc.), which are in constant interaction, construct the so-called “smart” architecture and city. A wide range of articles insist upon this, showing that the smart city and the digital city are not superimposed, but that they inscribe themselves into configurations of human and non-human actors. Nevertheless, social configurations that participate in these apparatuses are not systematically identified.
- 8 Another trend concerns the impact of digital apparatus on ways of perceiving and experimenting space, both at the individual and social levels. More generally, the renewal of urban design and planning practices sees itself changed, whether it be in positive or negative situations, such as surveillance. As suggested by Antoine Picon³, everyday planning processes tend to be replaced by “digital narratives” participating in the writing of urban scripts made up of events and situations. The authors of this issue give a detailed analysis of some of these narratives.
- 9 In this framework, the importance of collaborative and participative strategies that are favored by digital apparatus prove to be fundamental, just like their place in the overall reconfiguration of actors within design processes (public/private, startup/business, user/inhabitant, designer/builder/manager). Are we at the cusp of a “collective intelligence”? Could this intelligence be capable of erasing the power relations between decision makers and citizens, spatial planning professionals and users?
- 10 Finally, a last question concerns performativity, in this case the tendency to optimize knowledge and tools that are supposed to lead to a sort of reasoned ecology of human settlements, mediated by technology. There is a high expectation to mobilize metadata and Big Data in the reading and design of space. It seems capable of renewing approaches, even if it risks leaving aside social and human relationships.

- 11 In the six articles presented in this dossier, these five indicators (design/fabrication/management continuity; interaction with physical and digital environments; reconfiguration of the role of actors in design processes; collaborative and participative processes; performativity) are stated from different viewpoints and analytical frameworks.
- 12 From an ecological standpoint, Gwendoline l'Her, Myriam Servières and Daniel Siret study what the digital world brings to urban communities. Following the injunction of John Dewey to build audiences around groups of investigators, the “mapping party” to which he invites us allows for georeferenced data to be produced. It is important to show how digitalization can escape vertical and hierarchal relationships and can be reappropriated and practiced by residents.
- 13 Do these “smart city” apparatus erase power relations, especially within urban planning? Based upon a three-year ethnographic study carried out within the planning department of the City of Paris, Ornella Zaza shows how public space becomes a place of experimentation for new commercialization of “digital solutions”, with the risk of fading out the phenomenological design of public space and of reducing the inhabitant to a mere user of services. She notes that digital apparatuses produce an “urban narrative” that situates itself as a counter-expertise to usage and weakens the normal narrative of citizens.
- 14 Philippe Marin places the digital within a “general ecology” that allows to reconsider the relationship between nature and technique. Recognizing that the use of digital devices changes the ways in which we understand the world, he identifies different types of hybridization of physical and digital realities, revealing the shift in design activity towards a meta-design, characterized by the approach of generative processes and systems. This ecology engages interdisciplinary reflections that are at the intersection of configurations of actors, actions and objects, asking important ethical and societal questions.
- 15 Adopting a historical technical approach, Stephan Kowal cautions us against the impression of “novelty” which emerges with every technical revolution, by establishing that paradigm shifts do not solely rely upon tools. He thus proposes to revisit one of the first systems dedicated to the digitalization of spatial data, developed starting in 1962 in Canada, with the goal of assisting in decision making in regional planning. Inspired by philosopher Gilbert Simondon's theory of individuation of technical objects, the author insists upon the progressive autonomization of machines with respect to human intervention, questioning the performative function of digital cartography in architectural design.
- 16 Emmanuel Doutriaux questions digital through design, by focusing upon the conditions and the effects of the use of BIM tools in a Parisian architecture firm. On the one hand, he invites us to reflect upon “temporal distortions” provoked by digital apparatus: a simultaneous shortening and slowing down of the timelines of design projects and building, which he defines as true “schizophrenias”. On the other hand, he observes from Sophie Houdart⁴ at what point the digital is the agent – although not exclusive, but essential – of an atmospheric and environmental design of contemporary architecture.
- 17 Outside of these historical, urban and ethnographic investigations, the digital world has not ceased to solicit expectations and worries from architects. Among many others,

Claire Bailly and Jean Margerand seek to better grasp the ways in which Big Data, data mining and deep learning are capable of affecting design project mechanisms. Spanning the historical evolution of “worldviews” in different disciplines and assuming transfers between the universes of science and architectural design, they envision machine-augmented architecture and the emergence of a new “Modernity”. This text, based on a theoretical hypothesis which has yet to be verified, is the expression of a certain imagination with regard to the digitization of spaces, shared by our communities.

NOTES

1. Michel Foucault, *Surveiller et punir. Naissance de la prison*, Paris, Gallimard, 1969; Michel Callon, Bruno Latour (dir.), *La science telle qu'elle se fait*, Paris, La Découverte, 1991 [1982]; Bruno Latour, *Petites leçons de sociologie des sciences*, Paris, Seuil, 1996.
 2. Paul Ricœur, “Architecture et narrativité”, *Urbanisme*, n°303, nov.-déc. 1998, pp. 44-51.
 3. Antoine Picon, *Culture numérique et architecture. Une introduction*, Bâle, Birkhäuser, 2010.
 4. Sophie Houdart, Chihiro Minato, Kuma Kengo, *Une monographie décalée*, Paris, Donner lieu, 2009.
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