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Editorial

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archiDOCT

In the history of archiDOCT, data is the first topic that is taking up two volumes, a proof of the appeal of data as an extraordinary topic. This is a further confirmation of our speculations that the doctoral research oriented towards the world of data is paramount and seeks more fora to broadcast its several variants.

ArchiDOCT 17th "DATA - ii" differs from "DATA - i" as it focuses on a different object of inquiry. The first issue contained essays on the theoretical aspects of *Data, the technologies involved, and the relevant applications,* whilst "DATA – ii" contains essays on tooling, automation, and data-driven construction and modelling methods. An exceptional good-practice example is the prelude to the work of five doctoral researchers on the topic.

More specifically, 'DATA - i" focused more on the theoretical implications of the implementation of data in the fields of architecture, while exploring the ontological consequences within this entanglement, an on their reification into the broader field of the pedagogy of the discipline, the second one is based upon the premise that data is intangible entities continuously fluctuating in our environment but as a proper design material that can be used at different scales to address heterogeneous issues, with the capacity to lead the design process and circulate meaningful information. Whether we refer to the object, the building, or the city/territory, the implementation of data in architecture is intrinsically contextual and leads to inevitable connections with other domains, demonstrating at the same time the challenge to frame this topic from a single perspective.

The equivalent of the Vitruvian triad for what concerns data (collection, processing, analysis) does not directly apply to architecture considering its innate characteristic of being at the same time a discipline swaying between the sciences and humanities where relations are not linear, unilateral, or forethought. If in pure IoT and ICT, data is by definition 'structured', meaning that it adheres to a predefined data model and is therefore straightforward to analyze, with a strict connection between 'columns and rows' (Excel spreadsheet or SQL database), in architecture the assumption to investigate is quite different.

Data in architecture is a form of unstructured or semi-structured data where, in most cases, individual components or boundaries are not directly related to a rigid scheme or organized patterns following predetermined manner, as it happens in software such as Apache Grid, optimized to maintain and store multiple relations between nodes. As architectural practice is exposed to multiple and simultaneous influences, unstructured information may contain, at the same time, data such as dates, numbers, and facts. If properly detected and catalyzed, these could interpret as proper system 'glitches' through which the design process moves forward at it evolves.

Bearing this distinction in mind, the research gathered in this issue aims to investigate data from an applied perspective and focusses on specific objects of inquiry. DATA - ii contains essays on Data Software and Building Technology and Data and the Cities where topics such as automated production technologies, data retrieval methods and implementation in urban morphology, data assessment for building information modeling methodologies are presented and discussed.

Computational Intelligence: The Grid as a Post-Human Network, is good-practice example by **Phillippe Morel**, architect, founder of EZCT studio, and scholar-educator at eminent architecture schools worldwide. Morel's essay addresses the entanglement between the notions of technology and intelligence and their implications on production and its socio-economic and ethical context. As technology is itself a reflection of a particular intelligence, especially of the one that created it, it can offer insights into 'intelligence', no longer, as a specific character within a situated body in a determined space/time. According to the author, the current 'distributed paradigm' is where the concept of collective intelligence is fully expressed by grid com-

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puting, formally known as a group of networked computers, to reach a common goal. Different from cluster systems, each node can perform independently and perform simultaneous tasks. These post-human networks, defined as (a)-spatial and (a)-social, allow a new genre of complex (mass) production where the role of the human is limited to conceptual work. Such premises are exemplified in the work of the EZCT Architecture & Design Research studio, where attempts of moving towards the grid of design conceptualization and production have been made over the years. These experiments have also been the reason to reflect on the concept of collaborative practice not just as a human-exclusive prerogative.

The first essay, delivered from PhD **Fani Kostorou**, Bartlett UCL, is entitled **Visualising Change in 4D: Bridging larger- and smaller-scale data in architectural and urban morphology**.

The author explores the connection between data and urban morphology from both a quantitative and a qualitative perspective. Firstly, she discusses the possibility to collect and relate a series of 'un-structured' sets of information coming from heterogeneous means such as field surveys, historical maps, building permits, photos, text-view, and recordings. Secondly, she argues for the comparability of such datasets through their manipulation, organization, cleansing, and modeling throughout multiple tools such as NURBS Modeling, Geographic Information Systems, and Visual Programming Languages. Using an accurate three-dimensional model for the housing scheme of Cité Ouvrière in Mulhouse (France) as a case study, Fani presents an integrated operative framework to map and measure all the different changes that have been taking place either at an architectural or an urban morphology scale. The essay demonstrates how previous limitations can be overcome through enhancing spatial analytical models by producing and analyzing new meaningful dataset combinations through a proposed qualitative framework.

A geo-data collection strategy to assess undergraduate students' housing: A social, environmental, and spatial approach, is a choral effort of a group from the University of A Coruña (UDC) composed by **David Pereira-Martínez** (PhD Candidate), **Vicente López-Chao**, **Plácido Lizancos**, and **Virgílio Borges Pereira**, from the University of Porto (Porto). Their work focuses on the production of a spatial and analytical database to assess students' location and change of residency according to their study needs and university position, considering at the same time the modification of such dwelling over time. Their multifaceted analysis is conducted by gathering a sensitive amount of data led by a 'non-intrusive' philosophy towards the user's intimacy. The specific methods and tools described are intended to propose a new and efficient workflow in architecture and urban studies to implement social, environmental, and spatial features from a geo-data collection procedure. The group has used this holistic strategy to realize visual and qualitative outcomes to describe the students' housing phenomena and further propose urban requalification and performance-driven interventions.

The damage survey forms for Cultural Heritage between simplified procedures and needs for implementation: a critical analysis of data collected for the cemetery type after the "2012 Emilia" Earthquake, authored by **Veronica Vona**, PhD Candidate at the University of Ferrara, points out some of the criticalities emerging from the implementation of current damage survey tools for Cultural Heritage for cemeteries following the severe Emilia Romagna Earthquake (Italy). After a disquisition regarding the specific typology of the cemetery, both from a historical and an urban point of view, the essay focuses on how the existing tools cannot offer a proper operative framework to proficiently use the data recorded to produce meaningful analysis and elaborate effective intervention strategies. By identifying a series of criticalities about different categories (damage index calculation; experimental form introduction; macro-elements identification, etc.) the author presents part of her research-oriented towards more suitable frameworks and data acquisition methods for the field of damage evaluation.

Structural Expertise through BIM, delivered by **Víctor Fernández-Mora**, Department of Construction Engineering, Universitat Politecnica de Valencia, and **Víctor Yepes**, Institute of Concrete Science and Technology (SCITECH), Universitat Politecnica de Valencia, attempt to combine two identified trends in the Architecture, Engineering and Construction Industry (AEC Industry): Building Information Modeling (BIM) and the rehabilitation of existing and not efficient buildings. Specifically, the authors propose Building Performance Simulation Tools (BPS) to enhance structure expertise in architectural renovation, exploiting the possibilities of the BIM environment. The plug-in they developed extracts the data from the BIM Model (downstream moment), performs the analysis, and introduces the result back into the software (upstream moment) while informing the professional of the suitability of the element to support the new demands. Software interoperability and data exchange is the main feature of this integrated approach where problems related to uncertainties in structural behaviour, materials, and design of elements, can be addressed by offering professionals new tools at hand.

The last essay by **Bianca Andaloro**, PhD Candidate at the University of Palermo, is entitled **Data matters: two pioneering projects of interactivity in architecture,** focuses on the analysis of two pioneering projects to create an attractive binomial couple to highlight the importance of physical and virtual interaction between buildings, data, and environment.

Two projects, the Saltwater Pavilion by Kas Oosterhuis and Blur by Diller Scofidio, are described as useful examples where the exploitation of data and its consequential implementation in architectural design can lead to 'make the invisible visible' and suggest new relationships with the external environment and its continuous modifications.

The essay follows a research path that proposes interactivity as the catalyst of the so-called 'Information Technology Revolution in Architecture' and pictures a scenario of a renewed sensibility towards the definition of new connections between the building, the user, and the broader context.