

## **Editorial Volume 11 Number 2 2016**

The Design Management and Technology Journal, in this issue dedicated to “Research on Digital Fabrication in Architectural Design”, initiates a partnership with Iberoamerican Society of Digital Graphics (SIGraDi), which completes 20 years of existence in 2016. The SIGraDi integrates a network of similar organizations in Europe (eCAADe), North America (ACADIA), Asia and Oceania (CAADRIA) and West Asia and North Africa (ASCAAD) which, through its scientific meetings and publications, brings together researchers from architecture and urban planning, design and art related to reflection and application of digital media.

With this partnership, we intend to publish a number of the journal per year with articles resulting from the review and significant expansion of papers presented at the congress of SIGraDi in the respectively previous year. Under a relevant topic for the field of design technologies, pre-selected works and their authors will be invited to submit new articles to the blind evaluation process by peer review. We believe this partnership will enable synergy between the Journal and this scientific society, both interested in the dissemination of relevant research in their areas, which have significant intersection.

So, nothing better than to bring to light one of the latest issues in the relationship between built environment design and computing, which has been showing a high degree of impact on design processes and construction: the “Digital Fabrication”. The increasing expansion of access to numerically controlled production processes is allowing, on the one hand, the manufacture of complex shapes and, on the other, mass customization and production of small series. These issues have put on display a range of new possibilities for research. In the same way the creation of digital fabrication and rapid prototyping laboratories in schools of architecture and engineering around the world since the 1990s (in Latin America since the 2000s, with a recent peak between the years 2010 and 2013), and connections of architecture and engineering offices with automated production industries, point transformations already underway.

It is in this broader context that this number is inserted, bringing articles that articulate research on digital fabrication with a variety of applications: building renovation and customization of construction, open design and social housing, interaction between craft and digital methods for building complex shapes, application of gridshells produced by additive manufacture, development of responsive systems for solar protection of façades. After the pre-selection of 19 works, invitation to their respective authors from 09 different countries (Argentina, Brazil, Bolivia, Chile, Spain, France, Italy, Portugal and the United States), and the blind peer review process, were approved the 05 articles presented in this issue.

At the opening, the article Cork Re-Wall - Computational Methods of Automatic Generation and Digital Fabrication of Cork Partition Walls for Building Renovation, written by Filipe Brandão, Alexandra Palo, José Pedro Souza and Vasco Rato, exposes an computational method integrated to a digital fabrication process to generate high quality custom solutions using natural and renewable materials for projects aimed at rehabilitation of buildings constructed with traditional techniques.

The article by Andrés Passaro and Clarice Rohde, House Magazine: open source architecture, describes an open source construction process that uses digital fabrication in the production of low-cost housing. Based on WikiHouse building system, the project combines global knowledge to local production using full-scale prototyping of a first model, machined and assembled by the graduate students in order to test the quality of the system and its technical feasibility of implementing as social technology.

In Proto-tectonic Weaving System: Computational Design Workflow for Semi-permeable Self-Supporting Enclosures Roberto Naboni and Luca Breseghello present a work based on computational methods and behavior of materials in ancient construction systems such as woven baskets, for the construction of an experimental architectural system, the Weaving Enclosure. Performative and tectonic characteristics of twisted wood systems are explored through parametric design and geometry simulation in accordance with the flexible behavior of the material.

Computational Design and Simulation of Bending-Active Auxetic Structures, article by Roberto Naboni, coauthored with Lorenzo Mirante, investigates the potential application of auxetic structures - that when tensioned expand transversely and when compressed constrict transversely - in architecture. The work presents several arrangements that combine computational design methods and Additive Manufacturing (AM) to inform a form-finding process of bending-active synclastic gridshells, and finally propose a prototype of full size gridshell with additive manufacturing in situ.

Finally, the article Development of a responsive system for building façade protection – exploring and controlling a process presents a research and design process of façade protective elements, through the integration of parametric processes, geometry and physical computing. After demonstrating the different stages of this research involving the collection of data on the use of “Cobogó” in Recife, the paper presents the development of a geometric concept and the elaboration of different physical and digital prototypes for a responsive protection façade.

We wish you a good reading and long life to this partnership.

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