

archi|DOCT

The e-journal for the dissemination of doctoral research in architecture.

Supported by the ENHSA Network | Fueled by the ENHSA Observatory



10

February **2018**

www.enhsa.net/archidoct

ISSN 2309-0103

RISK

archi|DOCT

*The e-journal for the
dissemination of doctoral
research in architecture.*

Editors of the current issue: Ivan Cabrera i Fausto and Ernesto Fenollosa

Risk

Guest Editors: Ivan Cabrera i Fausto¹ and Ernesto Fenollosa²

Department of Continuum Mechanics and Theory of Structures,
Higher Technical School of Architecture,
Universitat Politècnica de València, Spain

¹ivcabfau@mes.upv.es

²efenollo@mes.upv.es

The 10th issue of the **archiDOCT** e-journal compiles papers that explore the concept of risk in architecture or that have considered risk as a key factor in their object of study. Architecture is a discipline which encompasses a vast variety of matters. These fields range from those where creativity, intuition and subjectivity play a fundamental role, to others marked by an extremely precise and technological nature. But in most of them students, do- cents, researchers and practitioners have to deal with risk in one way or another. As an alive and constantly evolving discipline that strives for new achievements, every new challenge in architecture frequently entails a risk of failure, non-acceptance, loss, bankruptcy, damage or even collapse. Innovation and risk are undetachable since new ideas and models may occa- sionally result in errors. In almost any scenario, risk is something impossible to be eradicated and then a specific strategy is required to deal with it. Each context will demand a certain attitude towards risk, which will result in a definite methodology. These tactics will depend on the perception of risk, on its holistic or fractional character, and on the magnitude of the consequences of failing. Assessing risks and even trying to quantify them constitute frequent options in fields where failure is something objective or that may endanger the whole result of a task, such as structures analysis and design, building and conditioning techniques, archi- tectural restoration or real estate management. However, characterizing risks and learning how to live with them are usual options in fields where failure is something often subjective and affects certain aspects of the final result but not the entirety. Hence, matters such as archi- tectural design, urban planning, landscape, graphic expression, architecture history, theory and criticism have learnt not only to coexist with risk but occasionally to flirt with it. Finally it is important to notice that the past deterministic, scientific and anthropocentric era, char- acterized as a time of certainties, has been followed by the current post-anthropocentric era, portrayed as a world of uncertainties and positioning risk in the centre of many exciting debates.

In exemplifying the aforementioned fields where assessing risks and trying to quantify them are a must, the paper “Reliability associated with the use of building structures analysis and design software” written by the Guest Editors of this issue, **Ivan Cabrera i Fausto** and **Ernesto Fenollosa**, along with two more colleagues from the Polytechnic University of Valencia, studies the importance of a good knowledge and expertise on the use of these applications in countries where architects have competences for analyzing and designing building structures. Due to the complexity of nowadays buildings and their structures, the purchase and use of a computer application is necessary. Practitioners want to minimize the risk implicit in the process of analysis and design of a building structure and hence they look for software which offers as much reliability as possible. But the concept of reliability of an

IT application of this kind is more complex than expected, since different aspects must be taken into account and literature about it is scarce. The paper details the different types of reliabilities inherent to the use of software for this purpose and provides some initial leads for designing tests which allow users to compare different options and might even assess reliability quantitatively.

This **archiDOCT** issue includes five papers based on doctoral research activities focusing on risk playing a major role in architecture. The concept of risk has been studied multiple, varied and interesting points of view, related to a vast range of tasks related to the daily practice of architecture such as structures, design, heritage, society and fire.

Víctor Fernández Mora, Ph.D. student at the Polytechnic University of Valencia, in his paper “Black Box Effect in the structural project: Avoiding it with BIM” deals with building structures analysis and design software as well, but focusing on its usual lack of transparency when running the calculations that doesn’t allow users to verify the correction of all initial assumptions and intermediate operations. Having defined the causes and consequences of the Black Box Effect in such procedures, this paper proposes to minimize its effects by integrating the structural project in BIM since it might guarantee that users have at any moment of the process a holistic knowledge of the project.

Antonis Papamanolis, Ph.D. student at the University of Patras, devotes his article “Prototypes, models and challenges to architectural education: An examination of the role of computer assisted Fabrication in the design process” to the effects that Computer Assisted Fabrication tools might be having on architecture, from theory to construction. He states that computerized means present new possibilities and challenges, but also potential risks for contemporary architecture. What could be understood as a new design process paradigm, has advantages such as an immediate physical access to design which enables architects to examine comfortably and richly their ideas by means of full scale prototypes or models developed with different levels of detail. But Computer Assisted Fabrication tools presents also dangers such focusing too much on the details of the manufacturing process rather than reflecting on the architectural aspect of the project.

Jordi Payola Lahoz, Ph.D. student at the Polytechnic University of Catalonia – Barcelona Tech, in his paper “Design of a prototype for the doors of the organ of the Cathedral of Tarragona” narrates an actual case of this daily practice that has become a fundamental part of his doctoral research. The essay deals with the analysis and design of a new structure for the old doors of the organ of the cathedral whose current frame and paintings date back to the XVI century. The new structure has to bear two doors with a height of 7 meters and a base of 4.6 meters each one with a system of posts and diagonals that might reproduce the original one or might be inspired in other layouts employed in contemporary similar pieces across Europe that have different behavior in relation to suspension. A final design not altering too much the original system and poetry has been tested so as to add to the pre-existences as less modifications as possible but improving their performance, always alert to the risk of ruining such an important piece of the Spanish heritage.

Irem Oz, Ph.D. student at the Pennsylvania State University, in the paper “The tale of the miracle of Duisburg: A miracle or an illusion?”, deals with social risk, a completely different sort of danger related to the possibility of failing when designing and placing architecture which might be understood as controversial by some people. The essay narrates the case of the mosque built in the Duisburg’s Marxloh district and what surprisingly was a quite relaxed time with no protests against the building of the biggest mosque in Germany. The author investigates the reasons for succeeding and theorizes that they may be rooted in three factors: the intense participatory processes that brought many actors together, the urban location of the mosque and the visibility given to the whole process by authorities and media. However and according to the author, the final result was perhaps less positive than expected.

María Fernández-Vigil Iglesias, Ph.D. student at the University of Navarre, in her paper “Building fire risk assessment methods: A hierarchical classification”, deals with fire, being one of the most famous risks in architecture. This essay considers fire a key element in architecture and argues that it may be caused by factors out of human control, but it may also be induced or catalyzed by designers, builders and users. Accepting that prevention is frequently the most effective measure to deal with fire and assuming that zero risk is not feasible, this essay makes a hierarchized review of fire risk assessment methods putting some order in the abundant but scattered literature and providing practitioners with a useful tool when looking for the best technique to be employed depending on the specific building needs.