COMPUTATIONAL DESIGN IN ARCHITECTURAL EDUCATION: INTEGRATED APPROACHES

FOREWORD

Computational design has an estranged position as a field of research in architecture. It has been rigorously studied by a growing group of design researchers for over thirty years. Yet, it is still a subject matter that is cautiously approached in most architecture schools around the world. While related graduate studies and research programs are on the rise, computation in architectural design education is widely perceived as an adventure best kept distant from the studio. When we consider the economic aspects that regulate our access to technology and the infrastructure that is necessary for it, this is perhaps expected. Nonetheless, that computation is not limited with machines is slowly becoming a common notion. Under the umbrella of design thinking research, computation is understood as a general term used for systematic thought processes. Similarly, computational design entails a wide variety of design technologies and methodologies. Moreover, spatial thinking is at the center of state of the art approaches in design computation. The possible reservation that a predetermined and quantitative systematic approach restricts the flexibilities preferred in a design process is thus obsolete in theory. Computational design research has come a long way since the Design Methods movement in the 70s. There is a growing use of computers as instruments of and computation as an approach to architectural design in the world. The need for the related research and practice in Turkey to gain speed has prompted a national symposium which then led to the preparation of this file.

The symposium, after which this special file is titled, was organized by Özkâr and Çolakoğlu and held on April 23, 2007 in the METU Department of Architecture, Ankara. Aiming to draw attention to the changing

definitions of computation and design, the call for papers had focused on integrating computational design to architectural design education. Participants were mostly from a few schools in Ankara and İstanbul confirming our initial hunch that this topic has not yet become widespread in Turkey. On the other hand, much to our satisfaction, the variety of topics presented has shown the considerable range of research in information technologies in design currently taking place in this geography.

In this special file, you will find a selection of papers based on five of the symposium presentations that have been invited for an English text and have been reviewed by international peers. The file presents a limited but varied cross-section of research done in the field in Turkey at this point in time. Each paper differs not only in content but also in approach. Authors have reported on their research in topics such as communications in design, design performance assessment, research through design, algorithmic thinking in design, and the sociological assessment of attitudes towards the use of technology in architectural education. At the same time, in terms of methods, their approaches range from writing a historical survey, to conducting a statistical analysis, or adapting a framework for future work to explorations of techniques in art and computing in design studios.

We anticipate that the immediate contribution of this dossier is twofold. Firstly, it calls attention to a variety of potential roles information technologies and computation can play in the curricular changes designed for architectural education in Turkey. Secondly, it gives a glimpse of the research interests in Turkey related with the field, and their strengths and weaknesses.

The very first paper in the file presents a sociological study that interests all educators in the architecture or related design fields. Focusing on how educators perceive the role of computer technologies in architectural education, Çil and Pakdil's inquiries at Yıldız Technical University delineates the experiences we all have at various levels in our own work environments. The survey aims for an assessment of the current situation at one particular school that has been most exposed to this technology in Turkey. At the same time, it is designed to provide answers to what possible sources may exist for a resistance to computer technologies.

Karakaya and Taşlı Pektaş, with a more specific topic of interest, draw attention to the use of Information and Communication Technologies in architectural education. Their paper discusses web-based studios as an environment for teaching various aspects of design with focus on interdisciplinary design collaboration. They advocate a methodical approach to conducting such collaborations and pursue a framework for exploiting this venue. Based on a theoretical set of guidelines, they describe criteria to serve all who wish to practice internet collaborations in design education.

İlal's contribution prompts the close connection between design and building processes and the integrated technology that serve both. He reiterates the role of computer aided design technology in the Architecture-Engineering-Construction industry with emphasis on an ideal "seamless" process for design and design assessment. He gives a short but inclusive historical background and the status quo of this industry along with what is still to do. İlal also underlines the designer's responsibility in becoming technologically literate to achieve this seamless process in service of environmental sustainability.

The last two papers in the file focus on the individual's design thinking process directly and the possible approaches for training for it at architecture schools. Çolakoğlu and Yazar are critical of the insufficiencies of traditional architectural education in keeping up with the fast developing design technology, where the pace of change in technology prompts the change in the design contexts that now require designers "to be geometrically aware and computationally enabled." They emphasize the potential of seeing algorithms as design tools and describe a course where this approach is employed. The course aims to develop student skills in computational thinking, that is conceptual organization among multiple levels of abstraction, rather than technical skills such as programming in computer languages, which is usually assumed when computation is concerned.

In the final paper of the selection, Özsel and Kozikoğlu describe the driving forces in their educational practice and four instances of it. They start with the assumption that the digital era provides a complex conceptual backdrop to design and prompts the growing notion of design as research. Design is not a problem-solving activity. But, similar to most others in the field of design computation, their approach emphasizes relational and systemic thinking in design. Their claim is to improve design knowledge through interdisciplinary dealings, especially with the arts. Hence, they encourage the use of prototypes as instruments of design, as in the arts. As many others have been before, their approach is inspired by the work of visionaries such as Leonardo da Vinci, Antonio Gaudi, and Frei Otto, as well as by İlhan Koman's well calculated and Gyorgy Kepes' psychologically well studied artwork.

We hope that even in its limited size, the selection of papers presented here show the potential vigor for research that needs to develop in the field. We look forward for the file to serve as an instigator to events and media that eventually will constitute a broad platform for discussing computational design research in Turkey.

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