GEDİZ UNIVERSITY
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2011
iSCSE

2nd International Symposium on

Computing in Science & Engineering

June 1-4, 2011
Kuşadası - TURKEY

PROCEEDINGS ABSTRACTS

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New Level of Precision in Architecture

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INTRODUCTION

Today, precision in architectural design has attained a new and a broad meaning with the advent of computational design and manufacturing/fabrication technologies, i.e with CAD/CAM. Literal definition of precision can be summarized as "the quality of being reproducible in amount or performance or level of accuracy [1]" has also been evolving with computational and information technologies to indicate the level of detailing, eventually the boundaries (and limitations) and/or constraints of the process.

LITERATURE REVIEW

The architectural design process which requires integration of several knowledge domains, handling diverse data and their processing has found new expansions with computational tools. Different modeling techniques and simulation models has accentuated the process rather than the design as the end product as well as enabled the exploration of more fluid forms. One of the direct consequences of this new paradigm has been manifested in the new structural forms, their materials and their realizations. Today, construction process has also been undergoing a transformation and construction has been turning into manufacturing and fabrication process. Terms like customized mass production, concurrent architecture and integrated design have become a part of architectural design "vocabulary". CAM and Rapid prototyping technologies enable different scale models and scale models can even replace the actual "product" in full scale.
All these changes force architects and thus architectural design education to be acquainted with CAD/CAM and in broad sense computational design paradigm. In this context, models which are ***any time products*** of design process, their reproducibility in different scales and media with different fabrication/manufacturing technologies, their explorations and experiencing through simulations, bring subject of precision in the realm of architecture.

METHODS

Therefore, it is important to explore this new level of precision in architecture in order to reveal all the potentials of CAD/CAM and computational design. Arch 475 which is a fourth year elective course in the Department of Architecture at the Middle East Technical University (METU), is an advanced design research studio aiming to inquire computational design paradigm and technologies accompanied by discussions on fundamental concepts of the domain. Like parametric design and widely used curvilinear even fluid forms, their materialization in different scales by CAM, performance based design and importance of architectural model in the design process both in the analysis/synthesis and simulations, and consequently precision.

FINDINGS & CONCLUSION

Term projects of Arch 475 have been formulated to invoke students to discuss these issues and experiment through their projects. In this paper this process has been exemplified by the term project given in spring 2010, namely the modulator. In the design and manufacturing and fabrication process of the modulator, students have been introduced with several level of precision and reflect their experience in 1/1 model of their design process or the product itself.

REFERENCES

[1] wordnetweb.princeton.edu/perl/webwn
[2] Alexiou, K., Johnson, J., Zamenopoulos, T. 2010. Embracing Complexity in Design, Routledge.
[3] Computer Aided Architectural Design Futures 2005, edited by Bob Martens, Andre Brown, Springer, 2005.
[4] Hopkinson, N., Hague, R.J.M., Dickens, P.M. 2006. Rapid Manufacturing: an Industrial Revolution for the Digital Age, John Wiley and Sons.
[5] Khabazzi, Z. 2010. Generative algorithms.
[6] Kolarevic, B. 2005. Performative Architecture Beyond Instrumentality, Spoon Press.
[7] Kolorevic, B., Kilinger, K. 2008. Manufacturing Material Effects Rethinking Design and Making in Architecture, Routledge.
[8] Scheneider, P.J. 2003. Geometric Tools for Computer Graphics, Morgan Kaufmann Publishers.
[9] Sessa, A. 2001. Changing Minds, MIT press.
[10] Silver, P., Mclean, W., Veglio, S., Hardingham, S. 2006. Fabrication: the Designers Guide, Architectural Press.
[11] Terzidis, K. 2006. Algorithmic Architecture, Elsevier.
[12] Terzidis, K. 2009. Algorithms for Visual Design, John Wiley and Sons.