
Prototypes for Non-standard and Interactive Architecture

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Abstract

This paper describes Hyperbody's prototypes development for non-standard and interactive architecture, wherein non-standard architecture is defined as an architecture, which departs from modernist, repetitive, mass-production principles in order to address complexity, variation, and mass-customization; furthermore, interactivity in architecture is addressed at the level where building components and buildings become dynamic, acting and re-acting in response to environmental and user-specific needs. This paper, furthermore, extrapolates from status-quo possible scenarios for 2019 with respect to implementation of mass-customization and interaction in architecture.

Keywords

Architectural design, Human-Machine interaction, Robotics

ACM Classification Keywords

H.1.2 User/Machine Systems, H.5.3. Group and Organization Interfaces, I.2.9 Robotics, J.4 Social and Behavioral Sciences.

Similarly to the way industrial fabrication with its concepts of standardization and serial production has

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UbiComp 2009, Sep 30 – Oct 3, 2009, Orlando, FL, USA

been influencing modernist architecture, digital fabrication influences contemporary architecture: While standardization focused on processes of rationalization of form, mass-customization [1] as a new paradigm that replaces mass production, addresses non-standard complex designs based on non-Euclidean geometries, which describe both hyperbolic and elliptic geometries. Furthermore, architecture incorporates increasingly aspects of dynamics and interactive-kinetics employing sensor-actuator technologies that enable building components to interact with their surroundings in a self-organized [2] manner.



figure 3. Full-scale physical prototype for Interactive Curtain

Hyperbody addresses issues of self-organization on the level of soft- and hardware implemented in robotic prototypes for architecture [3]. The project Interactive Curtain, for instance, has been designed and constructed by a team of architecture students within a vertical studio taking place in the fall 2008. The Interactive Curtain is, in fact, a portal being materialized as a 'wall' that senses when it is approached by a person and automatically creates an opening to allow passage – fig. 1. The wall consists of a series of strings that bend in order to create openings. In this context, architecture can be seen as

emerging from a process of self-organization, in which the dynamics of all parts of a system determine the result, and therefore, the architect becomes the designer of not only the result but also of the process, wherein urban and architectural components swarm and organize themselves according to predefined rules towards targeted spatial configurations.

Extrapolating from the in this paper described status-quo possible scenarios for 2019 with respect to implementation of mass-customization and interaction in architecture, it is conceivable that software and hardware prototypes will be incorporated in buildings in such a way that building components respond to external inputs by means of sensor-actuator technologies enabling them to interact with their users and their surroundings in a self-organized manner.

Acknowledgements

This paper has benefited, inter alia, from the contribution of Prof. K. Oosterhuis, the Hyperbody- as well as the Protospace-team incl. on projects working students.

References

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