ALGORITHM-AIDED INFORMATION DESIGN: HYBRID DESIGN APPROACH ON THE EDGE OF ASSOCIATIVE METHODOLOGIES IN AEC

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Abstract

Last three decades have brought colossal progress to design methodologies within the common pursuit toward a seamless fusion between digital and physical worlds and augmenting it with the of computation power and network coverage. For this historically short period, two generations of methodologies and tools have emerged: Additive generation and parametric Associative generation of CAD. Currently, designers worldwide engaged in new forms of design exploration. From this race, two prominent methodologies have developed from Associative Design approach – Object-Oriented Design (OOD) and Algorithm-Aided Design (AAD).

The primary research objective is to investigate, examine, and push boundaries between OOD and AAD for new design space determination, where advantages of both design methods are fused to produce a new generation methodology which is called in the present study AID (Algorithm-aided Information Design).

The study methodology is structured into two flows. In the first flow, existing CAD methodologies are investigated, and the conceptual framework is extracted based on the state of art analysis, then analysed data is synthesized into the subject proposal. In the second flow, tools and workflows are elaborated and examined on practice to confirm the subject proposal.

In compliance, the content of the research consists of two theoretical and practical parts. In the first theoretical part, a literature review is conducted, and assumptions are made to speculate about AID methodology, its tools, possible advantages and drawbacks. Next, case studies are performed according to sequential stages of digital design through the lens of practical AID methodology implementation.

Case studies are covering such design aspects as model & documentation generation, design automation, interoperability, manufacturing control, performance analysis and optimization.

Ultimately, a set of test projects is developed with the AID methodology applied. After the practical part, research returns to the theory where analytical information is gathered based on the literature review, conceptual framework, and experimental practice reports. In summary, the study synthesizes AID methodology as part of Hybrid Design, which enables creative use of tools and elaborating of agile design systems integrating additive and associative methodologies of Digital Design.

In general, the study is based on agile methods and cyclic research development mixed between practice and theory to achieve a comprehensive vision of the subject.

Dissertation:
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Presentation video:
https://youtu.be/QXgHtgZXqHI

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