Design methods in an AI-Mediated Era- History, Current developments and Future prospects

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During the 1960s, several architects and designers began to explore the potential of computational methods to automate the design process and the generation of form. Their ideas emerged within an intellectual milieu shaped by early forms of artificial intelligence, computational models in cognitive science, Chomsky's theory of generative grammars, and the work of the Design Methods Group. Architects thought that it was possible to produce their projects by translating design criteria into quantitative information using mathematical or linguistic models, such as graphs, pattern languages and shape grammars. Although these methods were promising, professional architects and academics were suspicious of any replacement of architectural design with algorithmic processes. The generative design paradigm resurfaced in the 1990s, partly due to the increasing demand for computational power in architectural design and fabrication. Architects employed techniques such as evolutionary algorithms, dynamic simulations and multi-agent systems, to generate and optimize architectural form, building shape, spatial layout and floorplans, sometimes in relation to parameters like building performance and energy efficiency. Yet, up till 2009 generative design methods had not been widely accepted and implemented by practitioners.

However, a change has recently been observed. Some recent studies report an 85% increase in publications related to generative design methods since 2015, reflecting a broader shift toward data-driven models enabled by advances in Artificial Intelligence. In particular, since 2020 the rise of Deep Learning has brought renewed attention to generative AI methods in architectural design, while interest amongst professional architects and academics has intensified. These new AI models diverge from earlier rule-based generative methods by learning patterns from large datasets to generate relevant design output, from raster images to vector drawings and mesh solids.

This conference track aims to investigate the relevance of generative architectural design methods for the practice of architecture and design, in the context of its past as well as its recent resurgence within the current framework of developments in data-driven generative AI. The track will explore the historical roots of generative design on the one hand, and its future implementation in the context of current AI, on the other. What systems of thought, theories and methods architects and designers employ to contribute to architectural design

and what lessons can we draw from the past? What kinds of practices can enhance creativity or automate mundane design processes within this AI mediated environment? What is the role of the architect or designer in this new design loop? Have we considered the educational impact of such developments?

Track _ Design Methods

Design methods in an AI-Mediated Era: Histories and Futures

1. Histories and Theories

- *Pre-AI visions: Cybernetics, Systems, and machines in design*
- *Digital design before digital technologies: Early encounters between computation and design*
- *Formal Rule-based systems in early Design Practice*
- *Milestones of Parametric and Generative design*

2. Design methods in an AI-saturated Landscape

- *Machining creativity: Generative Art and Design with and without computers*
- *From early Rule-based to current Data-Driven Methods: Deep Learning in Design practice*
- *Conceptual design in AI: Rethinking Diagrams and Sketches*
- *From raster images to NURBS models: Generative AI in CAD/BIM workflow*

3. Critical Perspectives and Ethical Frontiers

- *Automating the design process: dealing with unpredictability, autonomy and the AI black box*
- *Agency, Attribution, and Authorship in AI-Generated Design*
- *Human in the Loop: Designers and architects in the era of AI-driven design*
- *Creativity and Bias in Generative AI*

4. Futures of Design Education and Practice

- *AI as Studio Partner: Reimagining Pedagogies in Design Schools*
- *Sketching or prompting? Experiments in the design studio*
- *Reclaiming Slowness: Counter Design Practices in the Age of AI*