

Abstract of the Ph.D. dissertation:

***„Additive manufacturing in architecture. Preconditions, potential, and consequences for the design methods.”***

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Date: 16.06.2023

**Abstract:**

The doctoral dissertation deals with the use of additive manufacturing methods (AM), popularly known as 3D printing, in the direct production of architectural objects. This context is considered from the point of view of the interrelation of the material, the manufacturing tool, and the design methods used, with particular emphasis on understanding the consequences for the latter. The work postulates that in order to fully facilitate the potential offered by this mode of production, traditional design methods need to change, as they are inadequate to the scale, detail, and logic with which AM tools work.

The work consists of four parts. Part One; Introduction describes the theoretical and research background. Part Two; Basic Research, within which a catalog of 82 cases of architecture fabricated using AM are presented, along with architectural and technological parameters describing them. Based on the catalog, a quantitative and comparative analysis was carried out, aiming to systematize knowledge and select 10 cases subjected to qualitative analysis – a case study. Part Three; Experimental Research, presents successive iterations of the author's design method used to design, simulate, and optimize internal structures of architectural objects produced using additive methods. Part Four presents a summary of the research.

**Keywords:**

additive manufacturing, 3D printing, architecture, design methods



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