Research on the Optimization Method of Modular Design in Architecture Based on Digital Information Technology

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Abstract

Aiming at the existing problems in modular design, which are pattern's simplicity of the module and how to connect the form design of module with construction, the project reexamines the generating mechanism of architecture modular design. By applying the method of digital information technology, the research contains three aspects: the optimization design method of module unit, the optimization design method of group combination, as well as the constructive feasibility of optimal design. Firstly, utilizing the parametric programming tools, the research combines shape grammar and constructing logic to transform entity module into information module. By adjusting parameters, the probability and adaptability of the module form's generating can be extended; Secondly, on the basis of utilizing algorithm logic to realize the diversity of the modules combination, by applying the method of space syntax analysis and 3D virtual reality technology, the research obtains the optimal solutions to the modular space combination from the perspective of quantitative; Finally, by applying Kangaroo, SAT2000, Revit information model, the constructive feasibility of optimal design is verified, which forms a feedback to the design. Based on digital information technology, the project proposes a modular design method to update and optimize form generating and space operation mode of the existing modular design and promotes the transformation from design to construction, meanwhile to provide guidance for practical applications.

Keywords: Digital information technology, Modularization, Design method, Construction, Optimization