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3D Visualization for the Relationship of the Urban Rule and Building Form by Using CityEngine

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Abstract : The purpose of this study is to visualize how the rule related to urban design influences the building form by 3D modeling software CityEngine. In order to make the goal of urban design clearly connect to urban form, urban planner or designer should understand how the rule affects the form, especially the building form. In Taiwan, the rule pertained to urban design includes traditional zoning, urban design review and building codes. However, zoning cannot precisely expect the outcome of building form and lack of thinking about public realm and 3D form. In addition to that, urban design review is based on case by case, do not have a comprehensive regulation plan and the building code is just for general regulation. Therefore, rule cannot make the urban form reach the vision or goal of the urban design. Consequently, another kind of zoning called Form-based code (FBC) has arisen. This study uses the component of FBC which pertained to urban fabric such as street width, block and plot size, etc., to be the variants of building form, and find out the relationship between the rule and building form. There are three stages of this research, it will start from a field survey of Taichung City in Taiwan to induce the rule-building form relationship by using cluster analysis and descriptive Statistics. Second, visualize the relationship through the parameterized and codified process in CityEngine which is the procedural modeling, and can analyze, monitor and visualize the 3D world. Last, compare the CityEngine result with real world to examine how extent do this model represent the real world appearance.

Keywords : 3D visualization, CityEngine, form-based code, urban form
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