Simulation and visualization of thermal metaphors in a virtual environment for thermal building assessment

Yudi Nugraha Bahar, author

Abstrak

The current application of the design process through energy efficiency in virtual reality (VR) systems is limited mostly to building performance predictions, as the issue of the data formats and the workflow used for 3D modeling, thermal calculation and VR visualization. The importance of energy efficiency and integration of advances in building design and VR technology have lead this research to focus on thermal simulation results visualized in a virtual environment to optimize building design, particularly concerning heritage buildings. The emphasis is on the representation of thermal data of a room simulated in a virtual environment (VE) in order to improve the ways in which thermal analysis data are presented to the building stakeholder, with the aim of increasing accuracy and efficiency. The approach is to present more immersive thermal simulation and to project the calculation results in projective displays particularly in Immersion room (CAVE-like). The main idea concerning the experiment is to provide an instrument of visualization and interaction concerning the thermal conditions in a virtual building. Thus the user can immerge, interact, and perceive the impact of the modifications generated by the system, regarding the thermal simulation results. The research has demonstrated it is possible to improve the representation and interpretation of building performance data, particularly for thermal results using visualization techniques.