Interconnection System of 3D CAD and Game Engine Using Database

Purpose of research
In architectural CAD, the image displayed on an operation screen may not appear realistic, which can cause difficulty in the visualization of post-construction scenes. However, technological advancement of game engines is remarkable, and it is possible to generate real-time computer graphics that are rich in shadow and texture. To leverage this capability in the field of architecture, interoperability with 3D CAD is crucial. Intermediate file-based data coordination requires the accomplishment of complex tasks that are associated with the cyclic process involving design and visualization. Hence, the authors have proposed an interconnection system that incorporates a relational database for syncing 3D models on 3D CAD and virtual reality scenes on the game engine.

Method
The authors have performed a seamless collaboration that can transfer 3D CAD model data to the game engine by employing a database. By sharing the properties of parts, changes in various attributes (e.g., the height of a window) are instantly reflected in both software.

Material representation
Material representation performed by the game engine has a rich feeling, as compared to 3D CAD. Hence, pairs of materials have been defined for replacing the material representation performed by 3D CAD with the game engine’s corresponding material representation.

High extensibility
High extensibility of the game engine makes it possible to independently create a user-interface and thus easily add various functions. The following figures illustrate visuals of editing parts, scaled model mode and categorical display mode, respectively.

Screenshots obtained from the game engine