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Automated generation of dynamic, operations level virtual construction scenarios

The use of visualization and virtual reality (VR) technologies to solve operations level problems in construction has been limited to the creation of specific scenarios of very short duration (relatively speaking) resulting from long term efforts dedicated to the creation of specific cases. In order to capitalize on VR technologies in planning and design of construction operations, we must be able to rapidly generate alternate operations level virtual world scenarios for comparison, evaluation, and "what-if" analyses. Several external software and hardware processes are capable of generating information that describes dynamic construction scenarios. However, such processes cannot communicate directly with computer graphics facilities that must be invoked to depict operations in 3D virtual worlds. This paper describes work that led to the design of a specific description that facilitates rapid, automated communication between external authoring processes and 3D computer graphics facilities. This description, formalized as the VITASCOPE language, defines a necessary layer of abstraction that effectively separates 3D virtual construction worlds from the processes that generate them. This is critical in enabling rapid, automated interaction (often simultaneous) between multiple software and hardware processes and 3D virtual worlds.

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