Building Information Modelling-Based Diminished Reality Visualisation to Facilitate Building Renovation Projects

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Abstract : There is a significant demand for renovation as-built assets are aging. To plan for a desirable and comfortable indoor environment, stakeholders use simulation technics to assess potential renovation scenarios with the innovative designs. Diminished Reality (DR), which is a technique of visually removing unwanted objects from the real-world scene in real-time, can contribute to the renovation design visualization for stakeholders by removing existing structures and assets from the scene. Using DR, the objects to be demolished or changed will be visually removed from the scene for a better understanding of the intended design scenarios for stakeholders. This research proposes an integrated system for renovation plan visualization using Building Information Modelling (BIM) data and mixed reality (MR) technologies. It presents a BIM-based DR method that utilizes a textured BIM model of the environment to accurately register the virtual model of the occluded background to the physical world in real-time. This system can facilitate the simulation of the renovation plan by visually diminishing building elements in an indoor environment.