A Virtual Environment for Studying Immersion with Low-Cost Interaction Devices

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The objective of this project is to develop a virtual environment for studying how different modes of low-cost VR devices affect a user's sense of presence. Students will work with the VR JuggLua framework to build an interactive virtual environment that will include, at minimum, head tracking, navigation, and the ability to interact with virtual object to test the impact that different modes of interaction have on a user's sense of presence when completing a task of assembling virtual products. The proposed hardware for the interaction includes the Nintendo WiiMote, the Razer Hydra, and the Microsoft Kinect, as they are all commercially available input devices that have potential to lower the financial barriers to entry for virtual reality systems. The students will design the task, model the products, and create the experience. Once the environment is developed, the students will run a preliminary user study to determine the effect the different interaction devices have on the users' sense of presence and the unique characteristics each device brings to the experience. The experiences will be demonstrated at the 2013 ASME International Design Engineering Technical Conferences (IDETC 2013). The students will also have the opportunity to expand the work into a full comparison of user interaction that potentially could be suitable for academic publication.