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Paper Title: Comparative study on Ecological Cognition in real space and AR environment

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Abstract

The purposes of this research are to investigate the information needed to cognize the AR environment using Reaching and Obstacle Striding to identify the differences in Ecological Cognition between the real and the AR environments. Two experiments were conducted to verify the Ecological Cognition acquired in real and Augmented Reality (AR) environments. The first experiment was compared Reaching in each environment using head-mounted displays (HMD) of optical see-through and video see-through. There were no significant differences on Reaching in each environment, and the results indicate that comparable cognition would have been obtained. However, it should be noted that the user's cognition when wearing the HMD which is video-see-through, is as if the user's view of the real is forward from the actual position by the amount of the space. Another experiment investigated how much the foot is lifted up when getting over an obstacle. The higher the obstacle, the lower the foot height to obstacle ratio. A comparison of the same height between the real and the AR environments showed that in the case of the AR environment, lifted up the foot was higher for only lower obstacles. Possible factors include the lack of sufficient information for cognitive judgment and the viewing angle of the device.
