

# **Feasibility of Virtual Avatar Simulator for Human-robot Collaboration Training in Construction**

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## **ABSTRACT**

Construction workers need to be adequately trained to foster the required skills of collaborating with robots in construction jobsites. In this regard, immersive virtual environments have been employed in many fields as cost-effective and safe alternatives to conventional training practices. However, there are still concerns regarding the transfer of knowledge from a virtual setting to real-world situations. To address such concerns, this study investigates the feasibility of virtual avatar-based simulation as an enhanced training testbed for human-robot collaboration in construction. To that end, a comparative experiment was conducted in which subjects performed a masonry task in collaboration with a virtual robot using the conventional virtual reality and the virtual avatar-based simulation. Electroencephalography (EEG) signals were used to assess subjects' sustained attention during the training process. The results demonstrated the outperformance of the virtual avatar-based training in provoking individuals' sustained attention, indicating its feasibility as an enhanced training testbed for human-robot collaboration in construction.