Mixed reality improves education and training in assembly processes

ABSTRACT

Mixed reality is the outcome of blending the physical world with the digital world, made possible by technological advancement. Mixed reality is the next evolution in human, computer, and environment interaction. Augmented reality (AR) uses a virtual model of the real world, augmented by using a computer to see the real environment through a special display device. Current education and training systems in the engineering maintenance field are still insufficiently directed at the psychomotor skills in learning about machine parts, which makes them less effective for trainees. The oil and gas industry always face problems related to inefficiency due to downtime of critical equipment. This study was conducted at designing and developing a virtual reality (VR) and augmented reality (AR) system as a learning and training platform. This work also reviewed AR applications for machine part maintenance and assembly. An AR system was modelled and developed using the following software: CATIA, Blender, Unity and Vuforia. The effectiveness of using the AR technique in an education and training process was evaluated with 20 respondents among university students. The results showed that using this AR app enhanced the participant's understanding according to certain criteria and can be adopted as a learning method.

Keyword: Augmented reality (AR); Mixed reality; Unity; Virtual reality (VR); Vuforia