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Exploring how haptics contributes to immersion in Virtual Reality

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ABSTRACT

Virtual Reality (VR) has been around for more than fifty years but the technology hasn't reached practical usability until very recently. With the current head-mounted display (HMD) technology and an abundance of investment in VR startups, we have finally reached at the point where it is possible to simulate complex virtual environments that feel immersive. A major problem with virtual reality is that everything looks real but you can not touch and feel virtual objects. We are focusing on developing a device that will allow users to feel what they touch in VR. We developed a hand-held interface and an android app as a test environment. Commercially-available solutions such as the leap motion developer's kit were used to track the position of a user's hand. The actual touch sensation was delivered by a broad-band actuator. Informal testing suggests that being able to feel a virtual object, such as a virtual football, in the hands can enhance user immersion, enjoyment and performance in VR. Future work will improve hand tracking accuracy and range of touch sensations for a more realistic user experience.

KEYWORDS

Virtual Reality, Haptics, Athletics, Leap Motion, Google VR, Actuator, Simulation.