

The Summer Undergraduate Research Fellowship (SURF) Symposium

4 August 2016

Purdue University, West Lafayette, Indiana, USA

Haptic Foot Feedback for Kicking Training in Virtual Reality

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ABSTRACT

As means to further supplement athletic performances increases, virtual reality is becoming helpful to sports in terms of cognitive training such as reaction, mentality, and game strategies. With the aid of haptic feedback, interaction with virtual objects increases by another dimension, in addition to the presence of visual and auditory feedback. This research presents an integrated system of a virtual reality environment, motion tracking system, and a haptic unit designed for the dorsal foot. The prototype simulates a scenario of virtual kicking and returns haptic response upon collision between the user's foot and virtual object. The overall system was evaluated for its tracking accuracy and stimulation strength of the haptic devices. Our results will address the issues associated to yielding rich haptic sensation for the dorsal foot as well as the errors in tracking foot orientation. The study is currently on-going and preliminary results will be discussed.

KEYWORDS

Virtual reality, actuators, mechanoreceptors, haptic, touch, vibration, kicking