Investigation on the Use of Perception Manipulation to Enhance Virtual Reality Training

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Overview

We are motivated by the theory of action-specific perception and virtual reality training

1. **Virtual reality training**
   - Better than no training (Rose et al. 2000)
   - Equivalent or even better than real world training in some tasks
   - Safe and cost effective training
   - Training in virtual environment can be transferred to improve performance on the real task (Regian 1997, Rose et al. 2000).
   - Some trainings are already developed in virtual environment

Training for Fire-fighter (Bliss et al. 1997)

Training to improve social skills and brain activity (Yang et al. 2014)

Training for soldiers (Goldberg 1994)

2. **Psychology**

- Action-specific perception: people perceive the environment in terms of their ability to act in it (Gibson 1979)

Golfers who put the ball into the hole more often judge the hole as a target to be bigger (Witt et al. 2008)

Softball players who hit the ball successfully more often see the ball bigger (Witt & Proffitt 2005)

Tennis players who return more balls successfully than others see the net (obstacle) as lower (Witt & Proffitt 2010)

-> **PERFORMANCE DICTATES PERCEPTION**

Research question

1. How do the different sizes of golf hole in Immersive Virtual Environment (IVE) affect player's performance in virtual reality?
2. How does the practice with different sizes of hole in IVE affect player's performance in real environment after exposure?
3. What role does prior perception, measured before IVE exposure, play on the manipulation of the virtual environment training?

Hypotheses

1. Individual's initial perception of performance influences perception of the hole's size
2. Performance will improve or worsen depending on individual's initial perception of performance and virtual environment training exposure.

Methods

1. Golf putting training
   - The participants will do a pretest of golf putting
   - In experiment, the size of golf's hole is manipulated (small, normal, large)
   - Participants are trained in immersive virtual environment with all three different sizes of hole randomly
   - After each training, they do a post test of golf putting in real environment to see how each training affects their performance
2. Compare the result of pre- and post-training

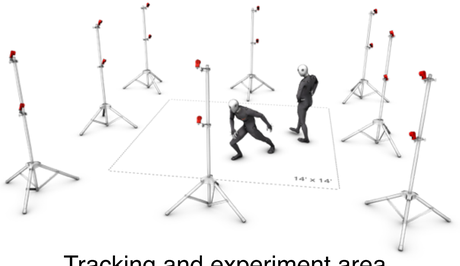
People are playing with mini golf

Work in progress

- We will run the experiment and collect the data
- Then, analyze the data to see if the perception which is trained in virtual reality affects performance in real environment.

Materials and Devices

Person wears an Head-Mounted Display



Tracking and experiment area

Golf club with marker (to be tracked)

Motive software showing tracked devices

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