The Use of a Virtual Cane for Improving Standing Postural Stability

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Research Question

• Does the Virtual Cane (VC) improve one’s postural balance during standing on an unstable environment?

Instrumentation

• A customized VC, see Fig. 1A. The cane provides distance information through hands so that users can adjust their posture to maintain balance. A graphic user interface was also developed to control VC settings wirelessly.
• A dual-axis robotic platform was used to simulate a compliant environment, see Fig. 1B.

Methodology

• Five healthy subjects participated in this study.

Experiment Protocol

- A questionnaire was provided to each subject after each session to collect their ratings of VC benefit.

Results

• VC significantly improved one’s standing balance in the medio-lateral direction, see Fig. 2.

Implication

• This study suggested that the VC can be used to improve one’s postural balance under unstable environments.
• Results also revealed that subjects can effectively use the VC after only two sessions of the experiment.

Future Work

• The VC size should be reduced to be more applicable in daily use.
• Data from mobile devices can be used to improve the performance of the VC.

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