Development of a VR Gait Training System for Fall Prevention in older adults

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In this study, we conducted two experiments aimed at developing a virtual reality (VR) system for fall prevention in older adults. Specifically, we carried out the experiments in a VR environment simulating a crowded scene to investigate the effects of environmental complexity on walking. In Experiment 1, to ensure system safety, young adults participated in a treadmill-based walking task. Three conditions of visual complexity (control, simple, and complex) were compared, and results showed that walking rhythm became significantly more complex under the complex condition. However, concerns were also raised regarding the safety of using a treadmill and the potential fatigue associated with prolonged VR use. Therefore, in Experiment 2, we replaced the treadmill with an in-place stepping task and conducted a similar experiment with elderly participants. As in Experiment 1, the complex condition resulted in greater complexity in walking rhythm, which was interpreted as an increase in degrees of bodily freedom. Moving forward, we aim to explore from multiple perspectives which types of VR environments and movements lead to improvements in gait   rhythm, in order to advance the development of the VR system.