Development of a system for the assessment of a dual-task performance based on a motion-capture device

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ABSTRACT

The authors produced a dual-task (DT) which provides a dynamic balance task and a cognitive task in a game system using motion sensors and virtual images. There had been no DT where a cognitive task needs a dynamic balance task which requires full body motions. We developed and evaluated a game system to assess the performance of the DT. The DT is to solve Sudoku using full body motions like Tái Chi. An ability to perform a DT is intimately related to risk of falls. To evaluate the developed system, we compared the performance of elderly people and young people. Generally, elderly people are at a higher risk of falls. 20 elderly community-dwelling adults (mean age, 73.0 ± 6.2 yrs.) and 16 young adults (mean age, 21.8 ± 1.0 yrs.) participated in this study. To compare the two groups, we applied an independent-samples *t*-test. The time taken for the elderly people was 60.6 ± 43.2 seconds while the time taken for the young people was 16.0 ± 4.8 seconds. The difference is statistically significant ($p < 0.05$). This result suggests that the developed game system is useful for the evaluation of the DT performance.
