A Study on Real-Time Feedback System for Forward Head Posture Using Markerless Skeletal Tracking

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The purpose of this study is to develop the Forward Head Posture(FHP) Feedback System using Markerless Skeletal Tracking and to improve its judgment criteria to compensate for the lack of persistence due to physically-attached FHP correction devices. Markerless Skeletal Tracking was implemented using RGB-Depth camera, and angle Theta was measured. Correlation coefficient between Theta and Craniovertebral Angle(CVA, reference for FHP judgement) was 0.95 or higher for all subjects(n=5), verifying to be sufficiently accurate. Also, we have measured Theta at the moment CVA is set to 50°(standard for determining FHP). Results confirmed that Theta is suitable for objective FHP judgment criterion(avg=82.1, STDEV=5.1). Next, postural correction effect of the FHP Feedback System was verified. The experiment was conducted for a total of 10 minutes with audio feedback disabled for the first 5 minutes, and activated for the next 5 minutes(n=5). The ratio of FHP was less when the feedback system was switched on than when it was switched off, and the average value of Theta was larger. Through this study, we developed a real-time FHP Correction Feedback System and showed its practicality. It can help with related researches on posture detection by automating the determination process of FHP through CVA, which has previously required manual measurement and analysis.