Sensors and Materials, Vol. 25, No. 9 (2013) 697–706
MYU Tokyo

S & M 0963

A Fatigue State Evaluation System Based on the Band Energy of Electroencephalography Signals

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(Received June 10, 2013; accepted August 26, 2013)

Key words: fatigue, anxiety, digital filters, ANOVA, EEG, microcontroller

Cranial nerve information can be used to correctly analyze fatigue states. Spectral analysis is the major method of identifying fatigue states. Various frequency bands can be distinguished by digital filters owing to their high accuracy and driftless features. The electroencephalography (EEG) signal is sent to a personal computer (PC) via a universal serial bus (USB) interface from a microcontroller and passed through digital filters within 200 taps, and thus, the spectrum of individual signals can be analyzed. This study has investigated the four EEG frequency bands, delta (δ), theta (θ), alpha (α), and beta (β), using four algorithms to evaluate the fatigue state based on the EEG signals. We compared the four algorithms and determined the best one.

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