Title :
The enhancement on stress levels based on physiological signal and self-stress assessment

Document Type :
Article

Authors :
Zahari, Z.L.,
Mustafa, M.,
Zain, Z.M.,
zaridahmz@unikl.edu.my
Abdubrani, R.,
Naim, F.

Abstract:
The prolonged stress needs to be determined and controlled before it harms the physical and mental conditions. This research used questionnaire and physiological approaches in determine stress. EEG signal is an electrophysiological signal to analyze the signal features. The standard features used are peak-to-peak values, mean, standard deviation and root means square (RMS). The unique features in this research are Matthew Correlation Coefficient Advanced (MCCA) and multimodal capabilities in the area of frequency and time-frequency analysis are proposed. In the frequency domain, Power Spectral Density (PSD) techniques were applied while Short Time Fourier Transform (STFT) and Continuous Wavelet Transform (CWT) were utilized to extract seven features based on time-frequency domain. Various methods applied from previous works are still limited by the stress indices. The merged works between quantities score and physiological measurements were enhanced the stress level from three-levels to six stress levels based on music application will be the second contribution. To validate the proposed method and enhance performance between electroencephalogram (EEG) signals and stress score, support vector machine (SVM), random forest (RF), K- nearest neighbor (KNN) classifier is needed. From the finding, RF gained the best performance average accuracy 85% ±10% in Ten-fold and K-fold techniques compared with SVM and KNN.