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Title: EEG Based Biometric Identification Using Correlation and MLPNN Models

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Source: INTERNATIONAL JOURNAL OF ONLINE AND BIOMEDICAL ENGINEERING **Volume:** 15 **Issue:** 10 **Pages:** 77-90 **DOI:** 10.3991/ijoe.v15i10.10880 **Published:** 2019

Times Cited in Web of Science Core Collection: 0

Total Times Cited: 0

Usage Count (Last 180 days): 0

Usage Count (Since 2013): 0

Cited Reference Count: 14

Abstract: This study investigates the capability of electroencephalogram (EEG) signals to be used for biometric identification. In the context of biometric, recently, researchers have been focusing more on biomedical signals to substitute the biometric modalities that are being used nowadays as the signals obtained from our bodies is considered more secure and privacy-compliant. The EEG signals of 6 subjects were collected where the subjects were required to undergo two baseline experiments which are, eyes open (EO) and eyes closed (EC). The signals were processed using a 2nd order Butterworth filter to eliminate the unwanted noise in the signals. Then, Daubechies (db8) wavelet was applied to the signals in the feature extraction stage and from there, Power Spectral Density (PSD) of alpha and beta waves was computed. Finally, the correlation model and Multilayer Perceptron Neural Network (MLPNN) was applied to classify the EEG signals of each subject. Correlation model has yielded great significant difference of coefficient between autocorrelation and cross-correlation where it gives the coefficient value of 1 for autocorrelation and the coefficient value of less than 0.35 for cross-correlation. On the other hand, the MLPNN model gives an accuracy of 75.8% and 71.5% for classification during EO and EC baseline condition respectively. Therefore, these results support the usability of EEG signals in biometric recognition.

Accession Number: WOS:000473225900007

Language: English

Document Type: Article

Author Keywords: Biometric; EEG; Correlation and MLPNN

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Publisher: INT ASSOC ONLINE ENGINEERING

Publisher Address: KIRCHENGASSE 10-200, WIEN, A-1070, AUSTRIA

Web of Science Categories: Computer Science, Interdisciplinary Applications

Research Areas: Computer Science

IDS Number: IF6XM

eISSN: 2626-8493

29-char Source Abbrev.: INT J ONLINE BIOMED

ISO Source Abbrev.: Int. J. Online Biomed. Eng.

Source Item Page Count: 14

Funding:

Funding Agency	Grant Number
Management and Science University Malaysia	

I would like to express my deepest gratitude and appreciation towards Management and Science University Malaysia for the financial support.

Output Date: 2019-08-01

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