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Dysphoria detection using EEG signals

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Abstract

Dysphoria is a state faced when one experienced disappointment. If it is not handled properly, dysphoria may trigger acute stress, anxiety and depression. Typically, the individual who experienced dysphoria are in-denial because dysphoria is always being associated with negative connotations such as incompetency to handle pressure, weak personality and lack of will power. To date, there is no accurate instrument to measure dysphoria except using questionnaire by psychologists, such as: Depression, Anxiety and Stress Scale (DASS) and Nepean Dysphoria Scale (NDS-24). Participants may suppress or exaggerate their answers resulting in misdiagnosis. In this work, a theoretical Dysphoria Model of Affect (DMoA) is developed for dysphoria detection. Based on the hypothesis that dysphoria is related to negative emotion, the input from brain signal is captured using electroencephalogram (EEG) device to detect negative emotions. The results from analyzing the EEG signals were compared with DASS and NDS questionnaires for correlation analysis. It is observed that the proposed DMoA approach can identify negative emotions ranging from 55% to 77% accuracy. In addition, the NDS questionnaire seems to provide better distinction for dysphoria as compared to DASS and is similar to the result yielded by DMoA in detecting dysphoria. Thus, DMoA approach can be used as an alternative for early dysphoria detection to assist early intervention in identifying the patients' mental states. Subsequently, DMoA approach can be implemented as another possible solution for early detection of dysphoria thus providing an enhancement to the present NDS instruments providing psychologists and psychiatrists with a quantitative tool for better analysis of the patients' state. © 2019 ASTES Publishers. All rights reserved.

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Affective Space Model; Dysphoria; EEG emotion; Multilayer perceptron

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