

STRESS INTENSITY DETECTION OF GAMERS USING ELECTROENCEPHALOGRAM

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Abstract

Modern days, the internet and computer systems are increasingly pervasive in our everyday routines and have influenced the way we live. We should pay much attention as we are gaining from the facts as to how internet or computer addiction affects human brain and well-being. One of the biggest concerns of many of them is the addiction to computer games and its negative consequences on the human brain as a result of gaming habits. Computer games have evolved with the advancement of information and communication technologies, improving the gaming experience for players. We hear that some teenagers were falling dead during playing computer games for a long period of time. If they had known that is affecting badly on their mental health and at the end of the day their life would pay off, that news might change a lot.

The health care industry is now making use of technological advancements to diagnose and predict the prognosis of diseases in their early stages. Electroencephalography (EEG) is one of the widely used to technique in bio-medical researches to analyse human brain. It can be used to detect the negative consequences, if a computer game has negative effect on someone's mental health.

In this study, a new EEG based stress recognition model is proposed with a simple UI. In this approach, an online available data set is used and only the sub bands that affects mostly on emotions are extracted and used to train and test the proposed model. In the implementation, the data has been augmented in order to train the model well and enhance the performance of the proposed model. SVM, KNN and ANN models are implemented. SVM model outperformed the other both, showing 79.41% of accuracy for Gamma sub band. It showed the same best accuracy 79.41% for both gamma and beta+gamma sub bands, when the data is boosted. Hence the proposed system goes with the SVM model. A simple interface is developed using Tkinter. It facilitates the user to input EEG array, do the analysis and display whether the player is capable of being stressed or not during the play.

Finally, the proposed solution was evaluated by domain experts. Some of their suggestions to improve the system were implemented with the given time frame. Also, some future enhancements were identified.

Key words: EEG, Stress analysis, Computer Games, Negative emotions.