Study of Mobile Game Addiction Using Electroencephalography Data Analysis

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Abstract : Use of mobile phones has been increasing considerably over the past decade. Currently, it is one of the main sources of communication and information. Initially, mobile phones were limited to calls and messages, but with the advent of new technology smart phones were being used for many other purposes including video games. Despite of positive outcomes, addiction to video games on mobile phone has become a leading cause of psychological and physiological problems among many people. Several researchers examined the different aspects of behavior addiction with the use of different scales. Objective of this study is to examine any distinction between mobile game addicted and non-addicted players with the use of electroencephalography (EEG), based upon psycho-physiological indicators. The mobile players were asked to play a mobile game and EEG signals were recorded by BIOPAC equipment with AcqKnowledge as data acquisition software. Electrodes were places, following the 10-20 system. EEG was recorded at sampling rate of 200 samples/sec (12,000samples/min). EEG recordings were obtained from the frontal (Fp1, Fp2), parietal (P3, P4), and occipital (O1, O2) lobes of the brain. The frontal lobe is associated with behavioral control, personality, and emotions. The parietal lobe is involved in perception, understanding logic, and arithmetic. The occipital lobe plays a role in visual tasks. For this study, a 60 second time window was chosen for analysis. Preliminary analysis of the signals was carried out with Acqknowledge software of BIOPAC Systems. From the survey based on CGS manual study 2010, it was concluded that five participants out of fifteen were in addictive category. This was used as prior information to group the addicted and non-addicted by physiological analysis. Statistical analysis showed that by applying clustering analysis technique authors were able to categorize the addicted and non-addicted players specifically on theta frequency range of occipital area.

Keywords : mobile game, addiction, psycho-physiology, EEG analysis

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