

Facial Expression Effect on Signal Quality and the Attention Level of Mind wave

ABSTRACT

The ability of single electrode electroencephalography (EEG) device such as Neurosky Mind wave has been widely explored in the field of Brainwave Computer Interface (BCI). It has been applied to the devices that are designed especially for people with communication difficulties and severe motor disabilities due to low cost wireless EEG and feasible for daily life usage. Many studies make use of the attention level to be a signal to control automated application such as a wheelchair or home appliance. Thus, this study was to investigate the effects of different facial expression on the attention and signal quality value using Neurosky Mind wave. The brainwave sensor was placed on the forehead frontal point (Fp1) and transmits the electrical impulses wirelessly to Arduino Mega via Bluetooth HC05. The microcontroller was programmed to process the brain signal accordingly and display corresponding output. The testing was executed by frowning and winking with the left and the right eyes. The respondent had to follow the instruction to do this three-facial expression. The time gap between two activities were ten (10) to fifteen (15) seconds approximately. The real time data of signal quality and attention value was monitored on CoolTerm. It was found that there was various attention value of the respondent when they executed the activities depending on their focus at that time. However signal quality of 25 could be obtained from all respondents when frowning. This value can be considered as an input signal for control mechanism with if further testing is implemented on a prototype to validate the finding.