

Analysis of Human's Attention Value in Gender and Age Category using Mindwave Mobile

ABSTRACT

Brainwave-controlled robot using a Brain-Computer Interface (BCI) system was designed and studied to help people with disabilities, especially for people who suffer from motor disorders such as Amyotrophic Lateral Sclerosis (ALS). BCI is a communication system that does not depend on peripheral nerves and muscles. However, the integrated robot controlled by the human mind has less efficiency due to the different type of brainwaves generated by a user. The purpose of this paper is to analyze the human's attention value in age and gender category for improving the mind-controlled robot movement. An electroencephalography (EEG) device called Mindwave Mobile is used to get the attention value generated by humans in the different type of gender (male, female) and age category (children, teenager, adult). There are five aspects of thought movement generated by human which is forward (F), right (R), left (L), backward (B) and stop (S). For statistical analysis, the main effect of gender on the attention value was analyzed by using independent sample t-test and the main effect of age category was analyzed by oneway ANOVA test while the interaction effect between these two factors was analyzed by two-way ANOVA test. The results show that male has a higher attention value than female for every aspect of thought movement except for the left and backward movement. This is due to the different size of the frontal lobe in gender. For the age category, the teenager is more focused than children and adult while the adult has the lowest attention value in every aspect of the movement. From the analysis, only in the forward movement shows that there was a significantly different in gender difference while there was no significant difference in the main effect of age category and the interaction effect between the gender and age category on the attention value for every movement. By doing this research, the movement of a mindcontrolled robot can be improved by setting the threshold value depending on the gender and age category of the user.