Title: Brain-computer interface for communication and control purpose

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Abstract

Brain-computer interfaces (BCI) are a type of assistive technology (AT) that uses the brain signals of users to establish a communication and control channel between them and an external device (usually a computer). BCI systems may be a suitable tool to restore communication skills in severely motor-disabled patients, as BCI do not rely on muscular control. There are several diseases that cause severe impairment of motor skills in affected patients, such as amyotrophic lateral sclerosis (ALS). The loss of communication (mainly with family and caregivers) is considered by ALS patients as even more negative than the loss of physical aspects. Another interesting assistive technology to improve the quality of life of these patients is the control of a domotic system through a BCI. Therefore, the objective of this work is to present the latest developed application of the UMA BCI group to provide communication and control system through brain activity for ALS patients. This application will focus on the use of a BCI that could allow patient communication through some of the most common messaging applications on a smartphone (WhatsApp, e-mail and SMS), and domotic control for controlling device such as a TV, air conditioner, music and lights. The control of the BCI is achieved through the well-known visual P300 row-column paradigm (RCP), allowing the user to select control commands as well as spelling characters.

Biography

Dr. Ricardo Ron Angevin (1971) gained his M.S. in Telecommunication Engineering and Ph.D. degrees from the University de Málaga, Spain, in 1994 and 2005, respectively. Since 1995, he has been lecturer at the Electronic Technology Department of the same university, where he is currently Associate Professor. He has developed his research in the field of Brain-Computer Interface (BCI), since 2000. The main objective of his research is to provide a useful application allowing subjects with neurological disorders, specially, subjects with Amyotrophic Lateral Sclerosis (ALS), to communicate with their environment in order to offer them a better quality of life. Since, he has been the principal investigator in 4 competitive publicly funded research projects in the field of Brain computer interface. He is manager of the UMA-BCI research group at the University of Málaga (https://umabci.uma.es)