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Electroencephalography fuzzy based classification for robotics learning applications

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Abstract

Electroencephalography (EEG) is playing a major role in today's robotics use and advanced applications. In addition, the complex EEG brainwaves are also being used to detect how human is performing daily complex tasks, while mirroring human behaviors to robotics devices and systems, as further introduced in Agashe. EEG based Robotics control, and their rehabilitation applications, are also getting active in terms of research trends and tools. Re-motorization of hand fingers after brain caused disabilities is not an obvious task. In addition, conventional neurological therapies and rehabilitations efforts have been found ineffective in rehabilitating upper- limb function after stroke or even traumatic brain injuries. In terms of rehabilitations, and advances of brain interfacing technologies, this made it possible to restore some of the motor functionalities. Advances in technology have resulted in new developments to help people with severe paralysis or even with limb loss. Intracortical brain computer interfaces, are also being developed to enable personals with disabilities. Recently, there are tremendous efforts and research directions to use the EEG Brain wave's signals and their associated patterns for Robotic-Prosthesis applications. This includes the rehabilitations (Rehab) applications. However, due to the complexity of the brain patterns, making use of these complex patterns for practical grasping learning Robotic is not a trivial task, Agashe.

Biography

E A Mattar has B.Sc. 1986, studied M.Sc. (University of Southampton), Ph.D. (Reading University), Gulf Exec. Program MBA (Darden School of Business, University of Virginia). He is an active IET member, IEEE member. He is also an X-member of Bahrain NATIONAL Higher Education Skills-Innovation Steering Committee. In 1994 he was awarded University of Reading Ph.D. in Cybernetics and Robotics Control (supervision of Prof. K. Warwick, professor of cybernetics). Worked on (14) research projects, including King Saud University Robotics Project, KSA. Awarded (21) awards, including University of Bahrain three best research awards in 1998, then 2001, 2002, 2006, and 2007 best undergraduate projects, Bahrain Police Academy Award (2012), and others research related awards.

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