AALBORG UNIVERSITY
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Project Proposal: Brain waves control of a robotic arm. Mind control for mobility.

Background Brain waves become more and more available in control systems with latest developments in technology for reading the EEG brain signals. Despite their very low energy and being highly affected by noise, EEG signals are reflections of the electrophysiological activity of our brain, bearing inevitably information about our thoughts. Extracting features appropriate for control of an automated system is essential and this issue has been a challenge over the past years. Several low cost systems for data acquisition and processing have been available on the market in the recent years, making attractive application in rehabilitation. Confinement in a wheelchair is a serious consequence of a spinal cord injury, drastically reducing the mobility of the affected person. Brain control of a robotic arm would significantly increase mobility and quality of life for tetraplegics.

Aim and Methods The project aims to record and process EEG brain waves for control of a robot arm. Appropriate EEG signal analysis must be performed for feature extraction for coding the input for control of the robotic arm. Understanding of EEG signal processing most common methods and principles, and design of input for robotic solutions in rehabilitation are the two most important learning outcomes of this project.

Perspective for Students Acquisition, processing, and interpretation of biological signals in an experimental frame, statistical analysis, conditioning and extraction of commands for control of a robotic arm are among the main topics covered within this project, representing key procedures with regard to sensing in an environment formed by biological processes.

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