

"System for detecting brain activity"

Description

This invention relates to a brain interface system for the acquisition, processing and classification of brain activity based on measurements of on-line Electroencephalogram (EEG) signals. EEG's are used to measure and record small electrical signals which occur on the surface of the scalp as a result of brain activity. The aim of this invention is to recognise from on-line EEG signals a few mental states and associate them to simple commands such as "move wheelchair straight", "stop" etc.

The system comprises of a plurality of electrodes arranged on a supporting structure, e.g. a cap, which produce electrical signals in accordance with the brainwaves of the person wearing it. These signals are then amplified and processed so that a mental state is identified and another signal indicative of this state is generated. The latter signal is then transmitted to a computer. At this stage, software processing tools for feature extraction and a robust and adaptive neural classifier are implemented to reliably recognise the desired mental state of any individual.

The novel aspects of the proposed system include wearability (the patient wears the system on his head as a cap or helmet), modularity and the analysis of the data at hardware level. Amplifying and processing the brainwave signal directly on the electrodes minimises the effects of ElectroMagnetic(EM) interference. Its small dimensions, low weight and low power consumption allow the system to operate in any environment. Furthermore, an easy-to-use interface has been implemented to control the configuration of the system by software. Moreover, the recognised mental states can be sent to the application through any communication method, e.g. conventional serial cable, optical fibre, infrared, radio frequency (Bluetooth protocol) or other technologies to meet specific needs.

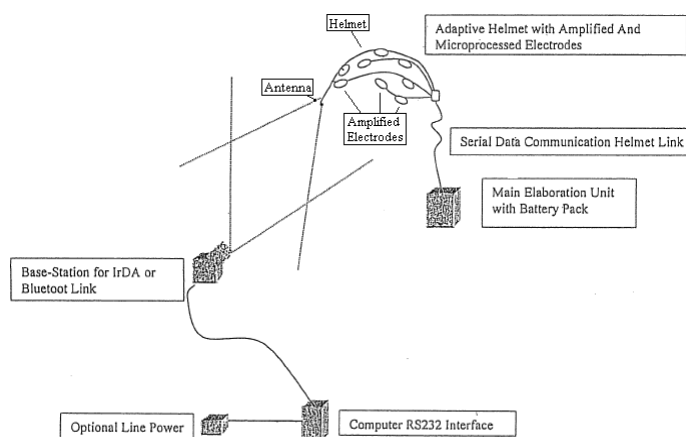
The immediate application of this invention is to extend the capabilities of physically-disabled people.

Areas of application

- Assistive technology
- Gaming industry

Innovative aspects and main advantages

- Data analysis at hardware level
- Minimisation of ElectroMagnetic interference
- Conventional means for data transmission
- Compact and practical structure (wearable, small dimensions, low weight, low power consumption)
- Easy-to-use interface for controlling the system by software



Stages of development

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Licensing contact

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