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Brain Computer Interface based Automatic Wheelchair System using IOT

Kaliappan*, Lenssen**, Simon Ameero***

*(Information Technology, National Engineering College, Kovilpatti
Email:kalsrajan@yahoo.co.in)
** (Information Technology, National Engineering College, Kovilpatti
Email:manasae.lenssen@gmail.com)
***(Information Technology, National Engineering College, Kovilpatti
Email: amro3003@gmail.com)

Abstract:

A brain Computer Interface (BCI) could be a system that enables direct communication between a pc and somebody's brain, bypassing the bodys traditional contractor pathways. rather than reckoning on peripheral nerves and muscles, a BCI directly measures brain activity related to the users intent and interprets the recorded brain activity into corresponding management signals for sure applications. The signals recorded by the system square measure processed and classified to acknowledge the intent of the user. although the most application for BCIs is in rehabilitation of disabled patients, they're more and more getting used in alternative application situations likewise. One such application is that the management of chair movement.

Keywords **—Brain computer Interface, Brain activity.**

I. INTRODUCTION

A brain pc interface (BCI) could be a system that enables direct communication between a computer and somebody's brain, bypassing the body's traditional contractor pathways. rather than lookingon peripheral nerves and muscles, a BCI directly measures brain activity associated with the users intent and interprets the recorded brain activity into corresponding management signals for sure applications. The signals recorded by the system square measure processed and classified to acknowledge the intent of the user. although the most application for BCIs is in rehabilitation of disabled patients, they're more and more getting used in alternative application situations likewise. One such application is that the management of chair movement. freelance quality is core to having the ability to perform activities of daily living by oneself. ample folks round the world suffer from quality impairments and many thousands of them

depend on powered wheelchairs to urge on with their activities of daily living. However, several patients aren't prescribed powered wheelchairs in the least, either as a result of they're physically unable to regulate the chair employing a typical interface, or as a result of they're deemed incapable of driving safely. for a few of those folks, non-invasive Braincomputer interfaces provide a promising resolution to the current interaction drawback.

II. OBJECTIVE

To develop Brain computer Interface primarily based Automatic chair system to assist the physically challenged folks for leading an freelance life.

III. METHODOLOGY

The projected system aims to develop a BCI application that may facilitate the physically challenged folks to guide AN freelance life with the assistance of their brain signals. Figure one shows the projected Brain pc Interface primarily based Automatic chair system. Initially, Bluetooth association can established between the receiver and therefore theelectroencephalogram (EEG) signal process unit. Once the receiver is turned on, reckoning on the necessities of the motor movements, actions would perform. The brain signals square measure currently extracted mistreatment Brainwave kit and convert to digital values and transmitted to signal process unit through Bluetooth. These values square measure then processed in mobile app and map into management signals of needed amplitude mistreatment Arduino like ATMega8 to activate the motors of the chair example. once totally different subjects performed identical actions, the signal values obtained were inside identical vary however the delay varied from person to person. it'll found that, this delay amount are going to be reduced by coaching the headgear for that person. The projected system consists of 4 purposeful units like Brian signal input, brainwave kit, encephalogram signal process unit and chair

A. Brain Signal Input

The brain signals {we will|we'll|we square measure going to} be mistreatment here are spontaneous encephalogram signals. These signals square measure related to numerous aspects of brain perform associated with mental tasks allotted by the topic at his/her own can. The mental tasks embody attention, eye blinks and eye movement for forward, reverse and stop actions, severally.

B. Brainwave kit

Brainwave kit is additionally referred to as as encephalogram Signal Acquisition Unit. The brainwave starter kit makes use of dry sensors that doesn't need application of a semiconducting gel between the sensors and therefore the scalp. Also, this device is way lighter and convenient for usage because it needs only 1 conductor for sensing. The

brain signals square measure transmitted to the signal process unit via Bluetooth association..

C. Encephalogram Signal process Unit

The encephalogram signal process unit consists of mobile, current booster and microcontroller. The brain signals can transmit from the headgear through Bluetooth to mobile application.The digitized price is then passed on to acceptable microcon-troller through USB port for more mapping of brain signal values to regulate signals of the motors within the chair example. AN H bridge is AN electronic circuit that permits a voltage to be applied across a load in either direction. These circuits square measure typically employed in AI to permit DC motors to run forward or backwards. H bridges square measure on the market as integrated circuits. they'll be engineered mistreatment separate parts.

D. Wheelchair prototype

Two motors of 60rpm each will used to form a wheelchair prototype. The frame will constructed using aluminium sheets. The control signals from the H-bridge circuit send to the motors. Depending on the action performed, the control signals will cause the motor to run in either in clockwise, anticlockwise direction or stop.

Wheelchair prototype
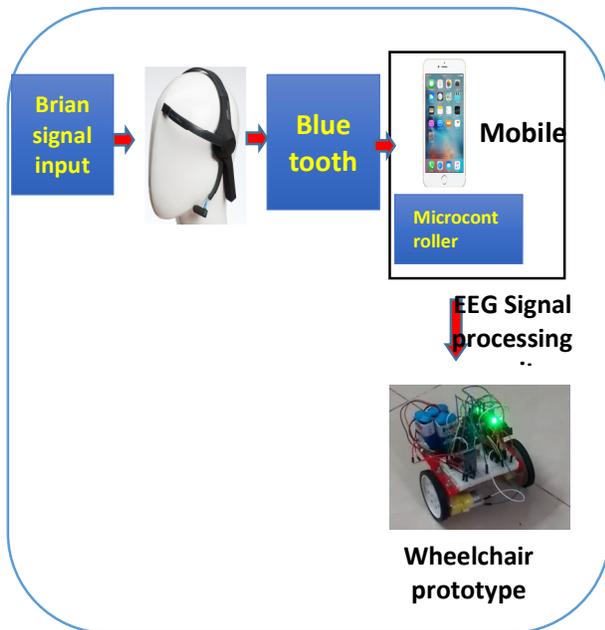
IV. CONCLUSIONS

In this project we'll be developing a BCI application that may facilitate the physically challenged folks to guide AN freelance life with the assistance of their brain signals. net of Things can produce a serious force on aid, ANd contribute to an overall improvement in its quality.

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