Striatum Manipulated Premise Automation

A. Gayathri
Electronics and communication Engineering
Angel College of Engineering and Technology
Tirupur, Tamil Nadu, India

K. Ranjudevi
Electronics and communication Engineering
Angel College of Engineering and Technology
Tirupur, Tamil Nadu, India

C. Manigandan
Electronics and communication Engineering
Angel College of Engineering and Technology
Tirupur, Tamil Nadu, India

T. Sabarijothi
Electronics and communication Engineering
Angel College of Engineering and Technology
Tirupur, Tamil Nadu, India

***Abstract*:- This paper presents a brain computer interface(BCI) to control home appliances by brain signals from visual stimuli.Brain Computer Interface(BCI) provides a communication channel between the human brain and the environment without requiring any muscular activation.Independent mobility is necessity to live everyday life for human beings.Paralyzed people have restricted mobility.For these people Brain Computer interface(BCI)provides a promising solution.Using Electroencephalogramcontrolling of appliances the mobility of these persons can beimproved. The proposed system is based on the setting the concentrationlevel(Threshold value)for controlling thehome appliances.**

Keyword: Brain Computer Interface (BCI), Electroencephalogram (EEG),Brainwave sensor, MATLAB.

I. INTRODUCTION

Now a days EEG meditation headset becomes an essential thing for physically challenged people and as well as paralyzed people.These headsets can provide a support to disable people in their day to day life.A healthy person can operate home appliances with the help of walking, remote control etc.But paralyzed people can't walk,and also they can't act to control the remote.For this reason some special technique has been proposed like eye tracking and many others,but it has some limitations.To overcome such challenges Brain Computer Interface(BCI) system has been developed which bypass all conventional methods of communication and directly interface brain of human being with communication devices.In proposed system brain send command directly to physical devices.Basically there are two types of brain computer interface techniques,invasive and noninvasive technique.In invasive technique the brain signals are recorded by an implanting electrode directly into cortex of brain.Electro encephalography (EEG)is an example of non-invasive technique of detecting brain activity. A smart home application can contain several commands according to the user needs. When the number of commands increased, Conventional matrix based stimulus interfaces may be distracting and cause prolongation of interaction duration process.

WAVES	FREQUENCY	LOCATION	USE
Delta	<4Hz	Everywhere	During sleep, coma
Theta	4-7Hz	Temporal and parietal	During emotional stress
Alpha	8-12Hz	Occipital and parietal	Reduce amplitude during mental imagery
Mu	9-11Hz	Frontal	Reduce amplitudes with intention of movement
Beta	12-36Hz	Parietal and frontal	Increase amplitude during intense mental activity

Table 1.1 (Brain wave ranges and uses)

II.PROPOSED SYSTEM

Proposed system is mainly depends upon EEG waveforms,Brain wave sensor,MATLAB and Arduino UNO are the key parameters of system.Figure 2.1 illustrates conceptual diagram of it

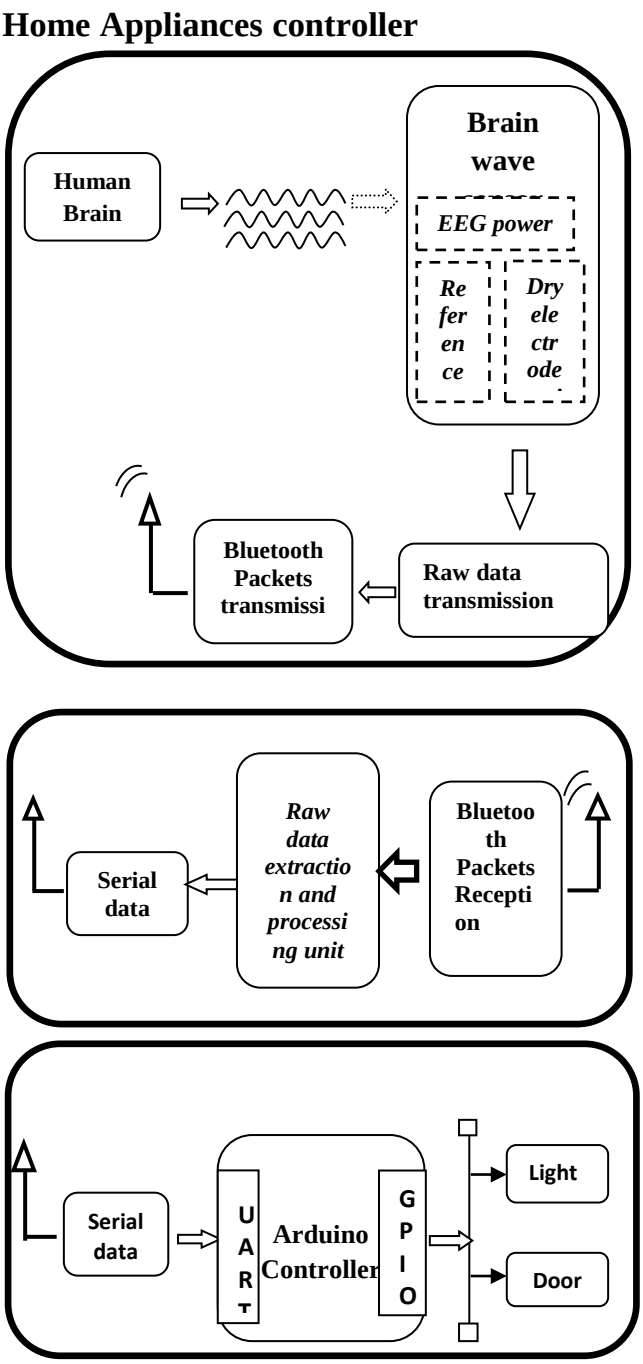


Figure 2.1 (Brain wave ranges and uses)

(i) Brainwave Sensor:

It is single node point sensor consists of dry electrodes. Gold-plated dry electrodes were used for system which consist a single channel having three contacts points i.e. EEG, Reference and Ground. Mu signals generated at frontal node (FP1) point detect and transmit data towards computer system. Transmitted data was in packets for

(ii)*Computer System:*

Computer system mainly consists of software based analysis. MATLAB analyzed data which are getting from sensor. The level of attention is compare with reference level and generates a command for movement.The visualize software is used here to on off the light and gate.

(iii)*Visualize Module:*

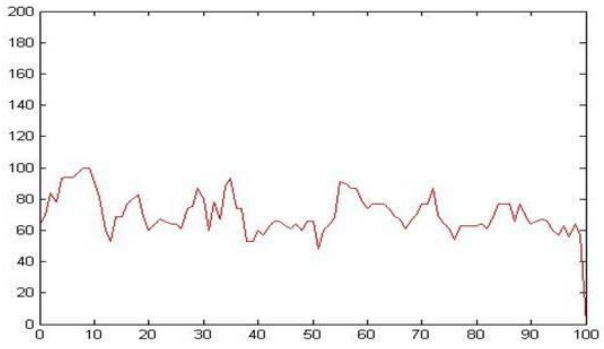
Arduino Uno controller received commands from MATLAB and generates respective interrupts signals. These interrupts signals provide command to visualize software which is installed in computer.The visualize software is used to on off the requiring commandsTable 2 shows how other movement achieved with different M1 and M2 combinations.

S.NO	CODE	PROCESS
1	a	Lights on
2	b	Light off
3	c	Gate open
4	d	Gate close

Table 2.2 (Coding Process)

III.PERFORMANCE ANALYSIS

Before starting execution of system, some concentration level of different users has been taken. It found thatConcentration levels of users were not being same. It has varied person to person. During experimental setup user were seated with Brainwave sensor connected to their forehead. Waveform shown in fig.3.1 illustrates concentration level of user at different points. X-axis and Y-axis represents time and concentration level respectively.It has found that an average concentration of a user was 70%. So it was a reference value for that user. By considering this reference value visualize module performed commanding operationfor home automation.. The reference value may vary person to person.



Concentration level diagram

IV.CONCLUSION AND DISCUSSION

Utilization of EEG signals are a significant research area which help physically challenged people. Brain controlledHome automation is slow but reliable method for paralyzed person. The proposed system uses an visualize

software to overcome the previous challenges and to achieve higher accuracy. Stability of system depends upon user thoughts so users have to take more training of system.

V.REFERENCES

[1] Jonathan R. Wolpawa, Niels Birbaumerc, Dennis J. McFarlanda, Gert Pfurtschellere, Theresa M. Vaughana "Brain–computer interfaces for Communication and control" Elsevier/Clinical Neurophysiology 113 (2002) 767–791.

[2] Siliveru Ramesh, K.Harikrishna, J.Krishna Chaitanya, "Brainwave Controlled Robot Using Bluetooth" International Journal of Advanced Research in Electrical, Electronics and Instrumentation Engineering, Vol. 3, Issue 8, August 2014, ISSN (Print) : 2320 – 3765, ISSN (Online):2278 – 8875

[3] Sarah N. Abdulkader , Ayman Atia, Mostafa-Sami M. Mostafa, "Brain computer interfacing: Applications and challenges" Egyptian Informatics Journal (2015)

[4] Brain Wave Signal (EEG) of NeuroSky, Inc. 15 December 2009.

[5] A. F. Perez, M. A. Oliver and G. Salas. "Development of a brain computer interface based on visual stimuli for the movement of a Robot joints".

[6] Nikhil R. Folane, R. M. Autee.Department of Electronics and Tele communication, Deogiri Institute of Engineering and management studies, Aurangabad(MS), India. "EEG Based Brain Controlled Wheelchair For Physically Challenged People".