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Brainwave Based Mind Control For patients

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Abstract

Among the whole human body, the brain plays a vital role in monitoring and maintaining the activities. People all over the world being affected by some sort of disorders, according to the World Health organization it is around 15%. Thus, this issue is being recognized and monitored to overcome the disorder; it's mainly helpful for paralyzed people. In this project, the attention and blinking level of a person are continuously demonstrated, by using a brainwave sensor. If the patient requires anything, their feelings are been sensed and monitored continuously, by deep concentration blinking more than two times, it automatically alerts the particular person through text message and even sensed in hospitals for an emergency.
Keywords – *Electroencephalography (EEG), brain stroke, MATLAB.*

I. Introduction

The interconnection of neurons forms the human brain. Each neuron in the brain consists of different patterns that denote emotional states, Thus when a person is acquired by any of these states, the current pattern of a neuron is correlated with the default state neuron pattern. When these patterns are matched an electrical signal wave is been produced. A unique electrical signal is been generated by the contraction of muscles. A Bluetooth module is been used were these electrical signals sensed by a brainwave sensor in the form of data is been transformed into packets and gets transmitted to the receiver. It is a sway system that allows individuals to speak. Received brain wave raw data are extracted and processed using MATLAB platform which shown in the data processing unit. With this complete system, we will alert an individual through text message and buzzer sound by the blinking level of a patient. In order to measure the electrical signal activity Electroencephalography (EEG) is been used. In this project, we tend to use a brain wave device to investigate the EEG signals. Firstly the person's attention level is been acknowledged by the brainwaves device. The blinking level of the patients is monitored by the brain wave sensor. Finally, it is compared with the minimum attention levels of humans where the system performance along with the captured EEG signals are compared to the characterized brain activity also the responses are maintained [2]. The proposed model is cost-efficient and used in applications such as automation, wireless communication, and wireless sensor networks. Brain interface has been developed for disabled people. Electroencephalography (EEG) is a tool for recording spontaneous electrical activity generated within the neural structure victimization multiple electrodes placed on the scalp. EEG signal may be a reflection of electrical currents flowing within the living thing area generated by the algebraically summation of simulative and repressing postsynaptic potentials occurring on several animal tissue vegetative cells [3]. The electrical activity of the brain caused by neural junction excitation is captured and measured by Electro Encephalogram (EEG). The signals ejected from EEG called as EEG signals are recorded by the help of electrodes so-called scalp electrodes. Indeed the quality of signals received is very poor because of the intervention of noise made either within or outside of the component. In order to reduce the noise, the signals are

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amplified. Different frequency ranges are as follows: delta, alpha, beta, theta, and gamma. In order to provide adequate commands for the operation, the brain laptop interface is been developed. Finally, the captured, monitored brain waves are translated in the form of commands by means of sequence. BCI has the task of restoring the ability of the patients and is taken into account [4].

II. Existing System

By using a brainwave sensor, mostly a wheelchair controlling, home automation, smart robot system, and even an Email interactive automation system is applied. These systems are helpful for paralyzed people but in a health-wise emergency situation the above systems are a failure. Even using an eye blinking sensor, the patient can be alert a person if they are emergency [5]. But sometimes, the attention and blinking level of a person is not accurate and even it calculates the normal blinking of a person.

III. Proposed System

To overcome the disadvantages of an eye blinking sensor, the brainwave sensor is used. The brainwave sensor calculates the attention and blinking level of a person by the movement of an eye blinking. When a person is in a normal state, the eye blinking level and the attention level are low. If there is emergency, the attention and blinking level is high and this system is helpful for a person as an alerting system.

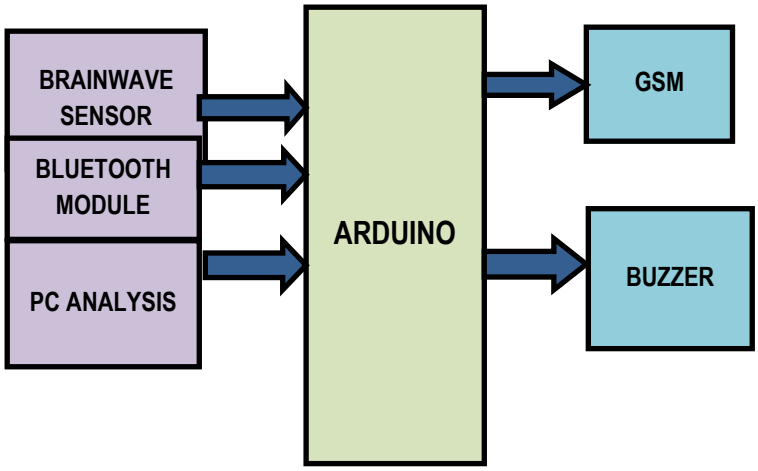

Fig.1 Block Diagram of the Proposed System

In Arduino, the entire setup is programmed. By using if condition, in the serial monitor, if the first condition (a==1) is applied then automatically text message (Emergency 1) will pass to the person, whose mobile number is given and it will also display in a serial monitor as a message sent. In the second condition (a==2) is applied then automatically text message pass (Emergency 2) to the person and also it will alert the person by using a buzzer system. These are the process that takes in these two conditions.

In every set of condition, it takes a particular rotation time to complete. After, the completion of rotation time other sets of conditions take place. In this setup, the Arduino programming is transmitted to the MATLAB through the Bluetooth module. The Bluetooth module will act as a transmitter and receiver [1]. The brainwave sensor is connected to the PC device. The brainwave visualizer application shows a wave formation that indicates brainwave sensor works. The Graphical User Interface (GUI) indicates in an x-y axis manner. The waves vary according to the human attention level. In this project, the attention and blinking level of a person are continuously shown, by using a brainwave sensor. If the patient feels any help or emergency, by deep concentration blinking in one or

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two times, it will automatically alert the person through text message and even in hospitals. So, this project is helpful for a patient in an emergency situation.

IV. Hardware Connection Setup

In MATLAB programming,Think Gear formula is employed. By mistreatment this formula, the eye level, and blinking level is setup. In higher than the graph, the red indicates the eye leveland black indicates the blinking level. the eye level is programmed for higher than sixty if the eye level is below sixty, its traditional state of an individual. Solely the extent is higher than sixty, it acts as an alerting system.

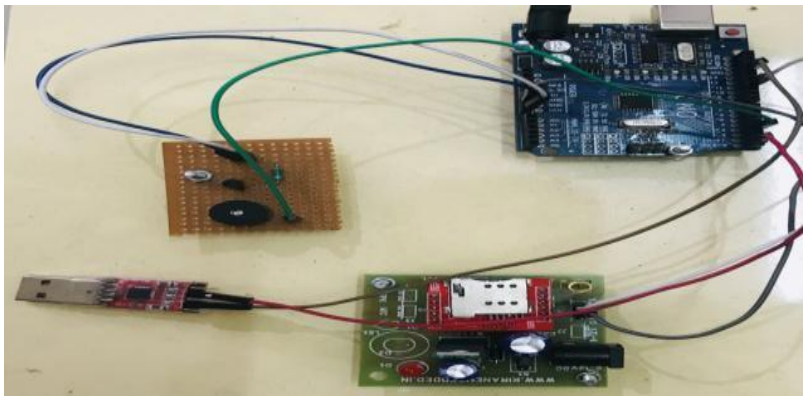

Fig.2 Hardware Setup

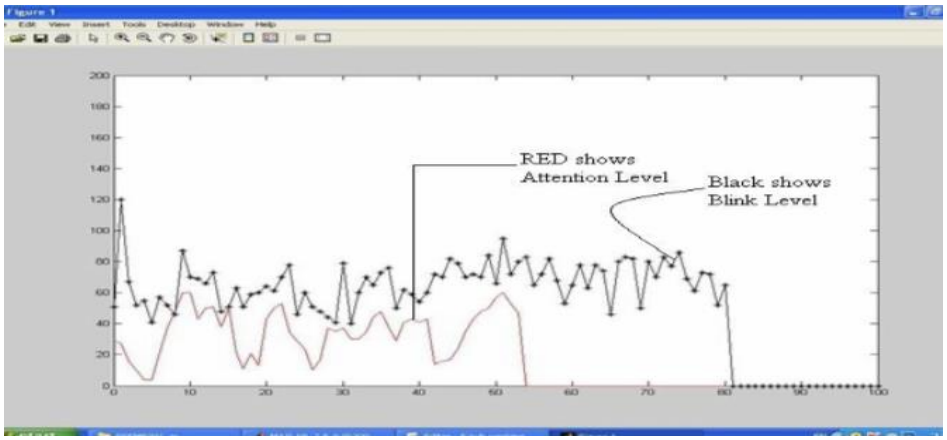

Fig.3 Simulation Result

V. Conclusion

Unfit folks or regular life is performed in this paper. Brain wave signals generated are alpha, beta, and gamma. The waves produced are in the form of square which is used to measure the alertness. To overcome measures that has to be taken for resolution and concentration. Each and every human body has different wave frequencies. The blinking level varies based on the disorder level. Typically it is used for implementation for home automation, health observation. Among all the methods, it is mainly used for multi-purposing methodology.

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