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IOT BASED HEALTH MONITORING SYSTEM WITH EEG ANALYSIS

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ABSTRACT:

Paralysis is one of the main breakdowns that lead to loss of movement of one or more muscles of the body, which depending on the cause, can affect a particular muscle group or area of the body or a larger area may be involved. In search of rehabilitation, the eye can be regarded as one from organs that can help paralyzed people communicate correctly. Eye movement can be used by paralyzed patients and people without arms to perform simple tasks.

This project illustrates the acquisition and analysis of eye blinking signals to activate devices for patients with paralysis. The method proposed here uses the minimum number of electrodes to produce signals, thereby reducing the occurrence of artifacts, and also after a simple circuit for performing the signal conversion, which is also advantageous from the user's point of view.

The flashing signal can be used as input to the MATLAB PC and perform sorting and interface with the microcontroller to monitor the devices via RS232.Aquí uses the AT89S52 as our driver.

KEYWORDS: Internet of things, Health monitoring, EEG analysis, etc.

INTRODUCTION:

Evolution technology provides significant changes in the way users use interactive systems. With a growing use of tablets and smart phones, you can see that the interaction between users and applications will occur to small screens and touch screens. While modern management tools such as the WiiMote and Kinect emphasize the need to adjust the interaction taking into account the physical movements of the user in the context of their use to support the proper use of the systems. Therefore, the development and development of interactive systems must meet new trends in technology to provide a better user experience, increase productivity and offer intuitive steps to perform various tasks.

An EEG-based brain-controlled home is a home with the help of the ECD based BCI for human control (hereinafter, the brain is controlled by robots refer to robots based on EEG). The two main types of robots controlled by the brain to help disability are controlled by brain manipulators and mobile robots. A representative of manipulators controlled by the operation of the brain is the pen used in the FRIEND system developed by Graser, which is capable of displaying the capabilities of the brain-controlled robot beyond the controllable laboratory situation. One of the categories is called "direct control by BCI", which means that BCI translates EEG signals into commands for controlling the movement of robots directly.

A typical example is the work of Tanaka et al, who first developed one robotic wheelchair controlled by the brain, whose turns left or right are directly controlled by the appropriate movement commands are translated signals of the user's brain during imaginary movements of left or right members and tested this system in real situations. However, the overall performance of this brain under the control of a mobile robot depends mainly on the performance of a non-invasive BCI, is now slow and unstable. In other words, the performance of BCI systems limits robots. In addition, users should issue engine control commands quite often, often causing fatigue. In order for the user to manage the device for a long period of time, the second group of brain-driven robots was developed in terms of overall control, in which the user (using BCI) and intelligent system controller autonomous navigation) share control over the device.

Several conditions of the brain are the result of different models of neuronal interactions. These patterns lead to waves having different amplitudes and frequencies. The signal generated by the brain, the sensor was obtained and divided into packets and data packets transmitted to the wireless medium (blue tooth). Curvature unit of measurement receives input data from the brain waves are converted into a signal using the MATLAB GUI platform. The instructions will then be sent to the module section page (light, fan).

LITERATURE SURVEY:

Alessandro L. Stamatto Ferreira et al. addresses only non-invasive BCIs, since this type of seizure is the only one that does not pose a hazard to human health. As materials of this work, we draw attention to research based on interactive BCIS systems focused on HCI and VR applications and discussion of problems and the future of this issue.

The degree of freedom of these interfaces is the data transfer rate, the accuracy of detection of mental processes and the number of selectable commands. The BCI configuration is currently used primarily to move the cursor on the computer screen, control external objects such as wheelchairs or writing tasks. Intelligent house management systems require particularly high accuracy, many options, and ease of use, but the data transfer rate is less important than writing applications.

Kevin C. Tseng et al. suggested the brain of a computer interface based on intelligent multimedia controllers to select music in different situations depending on the physiological state of the user. Here, a commercial mobile tablet was used as a multimedia platform and a module for wireless collection of a multi-channel electroencephalogram (EEG) in real time EEG monitoring was developed. Intelligent multimedia management software multimedia platforms built for the analysis of user EEG functions and select the music of a developed state. The relationship between user status and the orderly listener of music preferences was also examined in this study. Experimental results show that BOS music in real time in accordance with the EEG user feature can positively improve the state of the user's attention.

Nupur Praseep Sarodeet al. developed a home control device as an auxiliary technology. The brain signals are detected by the sensor and converted to brain packets and transmitted through a Bluetooth environment. The level analyzer unit (LAU) receives the raw data from the brain wave and extracts and processes the signal using the Matlab platform. Then, the control commands are transferred to the raspberry module Pi for processing. However, this system, we can control the home device through configured brain signals. The collection module and the physiological signal processing module integrated signals are designed for long-term monitoring of the EEG analysis and back-end, respectively. The configuration can work in the home network, and the control devices can be controlled automatically by changing the active state of the user. This model provides a new prototype system for managing the home network and can be extended and integrated with the home network for other applications.

Harish Verlekar et al. proposed the use of this technology for home automation. Home automation can be completely revolutionized by the use of BCI. The brain produces several types of waves, such as alpha (9-13 Hz), beta (14-30 Hz), theta (4-8 Hz) delta (1-3 Hz). Using these waves, we can control various household appliances. The concept consists of 4 main stages of detection, amplification, processing, and output. Firstly the detection of brain signals that use EEG electrodes or the cover. These brain signals are very weak, so in the second phase, we have to strengthen these brain signals for the desired number and filter them to eliminate the noise. Then, thirdly, we have to convert these signals to digital using the A-D converter, and the type of computer software or a microcontroller. Fourthly, assuming the decoded signal and sending these signals wirelessly using a radio-frequency circuit for a remote switch circuit that turns on or off the nearby device. Using this technology, people's lives are going to be simplified even more, the physical effort will be greatly reduced, and this will also be of great help to people with disabilities.

PROPOSED SYSTEM:

As supplied, a general purpose computer - a blank slate; the manufacturer does not know what the customer wants. A client can use it for a network file server, who else can use it exclusively for the game, and the third can use it to write the next great American novel.

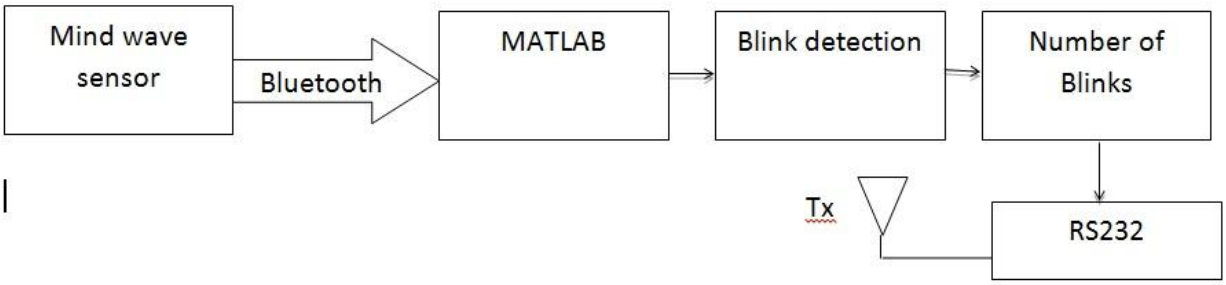

Fig.1: Block Diagram of Proposed System

Above figure 1 shows block diagram of proposed system. Often, the embedded system is an integral part of a larger system. For example, modern cars and trucks contain many built-in systems. An integrated ABS control system, other monitors and vehicle control emissions, and a third displays information on the dashboard. In some cases, these embedded systems are connected by some kind of communication network, but this is definitely not a requirement.

Given the potential risk of confusion, it is important to note that a general-purpose computer consists of many embedded systems. For example, my computer has a keyboard, mouse, video card, modem, hard drive. For example, a modem is designed to transmit and receive digital data over an analog telephone line. That's all, and all other devices can be summed up in one sentence too.

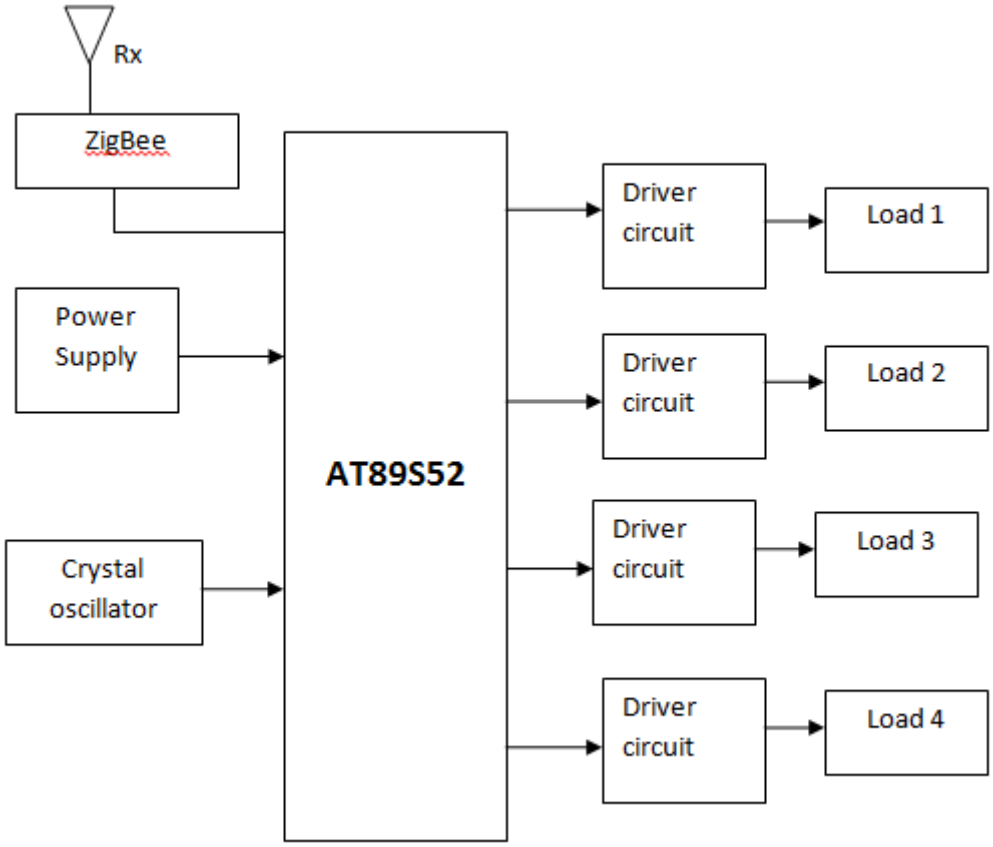

Fig.2: Block Diagram of Embedded System

If the integrated system is designed well, the existence of the processor and software can be completely transparent to the user's device refers to a microwave oven, VCR, or alarm. In some cases, it would even be possible to create an equivalent device that does not contain a processor and software. This

can be done by replacing the combination of a special integrated circuit that performs the same function on the hardware. However, greater flexibility is lost when the hard design is cooled that way. This is much easier and cheaper to change a few lines of software than a new version of the custom hardware.

MIND WAVE SENSOR (EEG):

The electroencephalogram (EEG) is the recording of electrical activity along the scalp. It measures EEG fluctuations in voltage as a result of ionic current flows inside the neurons of the brain.

Derivatives of the EEG technique include evoked potentials (PE), which include an average of EEG activity over time before any stimulus (visual, somatosensory, or auditory). Event Related Potential (ERP) events are averaged EEG responses that are blocked over time for more complex processing of stimuli; this technique is used in cognitive science, cognitive psychology, and psycho physiological research.

IOT MODULE:

Express if Systems' Smart Connectivity Platform (ESCP) is a high-performance, high-performance wireless SOC suite for mobile platform developers with limited capabilities and disabilities. It provides unparalleled ability to build on Wi-Fi capabilities to other systems or function as a standalone application with minimal cost and minimum space requirements.

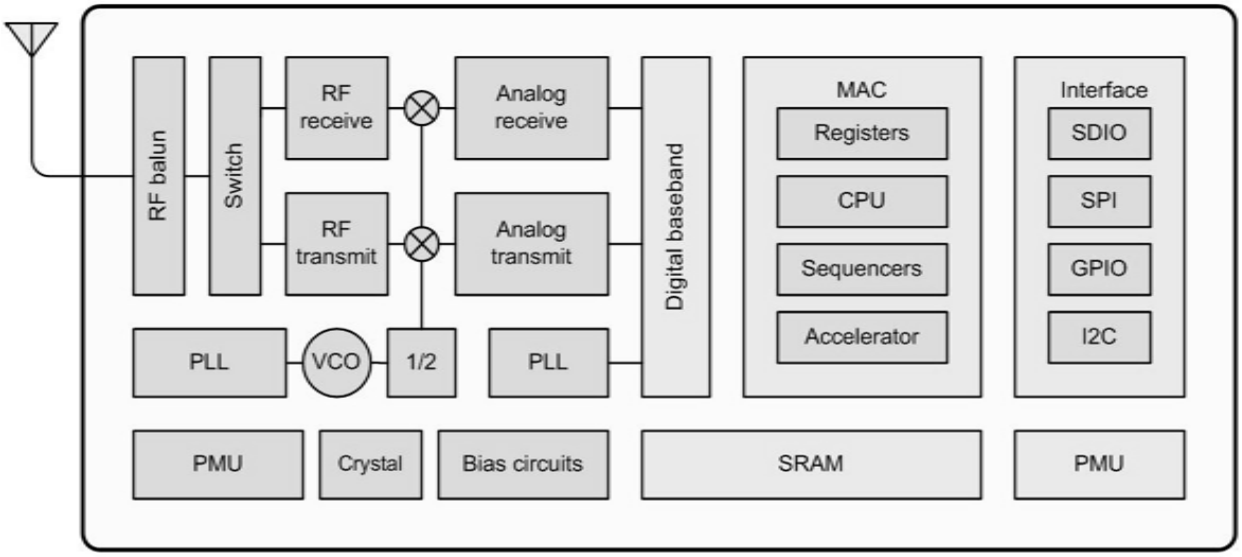

Fig.3: Block Diagram of IOT Module

The ESP8266EX was designed for mobile, portable Home Appliances, Home Automation, Smart Plug, lights Mesh Network, Industrial Wireless Control, Baby Monitors and Internet applications to achieve the lowest energy consumption with a combination of several patented techniques. Active, hibernation and deep sleep mode: saving the function, especially in 3 modes Energy Architecture.

Using advanced power management and logic to switch functions is not necessary to control the switching between standby and active mode, the ESP8266EX consumes approximately 60uA deep sleep mode (PSTN running hours) and less than 1.0mA (DTIM = 3) or less than 0.5 mA (DTIM = 10) to remain connected to the access point.

In standby mode, the standby mode was only calibrated real-time clock and monitoring timer. The real-time clock can be programmed to wake up ESP8266EX with any interval required. ESP8266EX can be programmed to wake up when a condition is detected. This minimum time attendance function ESP8266EX can be used by mobile devices, SOC, which allows them to stay on hold, low power mode, as long as there is no need for Wi-Fi connection.

CONCLUSION:

When using sensor, automation is achieved. The experimental work was carried out with care. This project is carried out with the use of the advanced micro controller. This paper looks at the home, which is controlled by the brain, based on brain-computer interfaces (BCI). BCI - is a system that can bypass the normal communication channels to provide a direct and control connection between the human brain and the physical devices by moving the different models of real-time brain activity into the command (i.e. Muscles and thoughts.). With these commands, any device can be connected in a home environment. This document will be the technology of assistance for people with disabilities in the future.

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