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Home Automation system: By Eye Blinking for Paralyzed and Disabled people

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Abstract— Paralysis is an important neural condition that causes the dysfunction of one or two muscles of the body, affecting the selected muscle group or area body or wide and anxious space when you look at the cause. In seeking renewal, focus is also considered to be special in all organs that will assist a person with an impairment to talk correctly. Paralyzes patients and unarmed persons often use eye movements to execute basic tasks. This paper is all about the study of mechanical mobility for patients with disabilities in home appliances. The system outlined here utilizes the eye blink device for the detection of eye movement, whatever follows a simple electronic device for the use of the signal mechanism, which adds to the price and assists the reading point of the user. And this used signal is also used as an associate in microcontroller nursing input for home control materials used.

Keywords— Home Automation, Blinking, Disability, MDN, Microcontroller, Arduino Uno, Wireless, wireless.

I. INTRODUCTION

[1] Motor Neuron Disorder (MND) is an irreversible neurological disorder in which the patient's motor neurons assess the damage. In combination, muscle weakness in relation to the hand, foot or voice is induced. As a result, the patient is unable to carry out his or her voluntary intervention, and voicing their desires is a big challenge for patients. And the patient faces a big challenge as well, such as being unprepared for world touch.[2] In MND, the nerve breaks and consequently stops working. We have always been fascinated by technical advancements. On the other hand, we also find that there is no meaningful study of physically impaired or disabled persons on automation

systems. We started looking at published articles and new things around us, thus. [3]Medical science is evolving day by day now. People are developing very tight smart belt for monitoring patient breathing and electro dermal activity are examples of scientific accessories (EDA) in this growing phase to display symptoms of fainting at night in the physiological series. It is simpler now that medical surgery is available.

[7]The ability to regulate muscle activity in one or more muscle groups is lost in people with disabilities. Stroke, ALS, multiple sclerosis, and a variety of other diseases may all contribute to this disorder. [6]Locked in Syndrome (LIS) is a syndrome in which the patient loses control of almost all of his or her voluntary muscles. Except for a brief moment of eye contact and blinking, these people have no power over any aspect of their bodies. These people are unable to talk, send messages, or communicate normally as a result of their illness. Even if people with LIS are aware of it, their thoughts and ideas are hidden away inside them. These people communicate by blinking their eyes. They have confidence in the nurse.

[5]Blink to Speak gives people with disabilities a sense of freedom. Optical light is converted into Speak by the software platform. Eye movement will monitor any part of the app. As a result, individuals with disabilities can use the app separately. Patients may use the app to record messages, read them aloud, and send them to others.

[10]New technology gadgets have recently been modified on the body of the patient to restore natural functions. Patients with disabilities in particular, such as

tetraplegic patients who suffer profoundly from physical impairment. A system that can support patients with disabilities such as tetraplegic patients is now very necessary to create. In addition, with less body gestures, people have a great desire to digitize their everyday lives. It is high time to build a software to support Tetraplegic patients and individuals interested in using it properly and comfortably.

Another study in this room is aimed at focusing on innovative communication methods that work well in converting their eye movements into active communication messages for patients with disabilities. Leading their lives is the most significant error faced by disabled patients and it is not conceivable to be easy for someone else. This involves simple everyday tasks, such as moving to a compatible computer or the speed of the fan. To build simple and economical management, most current systems use sophisticated hardware and computer code. The greatest challenge facing a disabled patient, however, is that misuse in this service is available. The bad thing about this type of software is the established fact that they have a computer for a limited time to operate the equipment. To monitor what works, the user must have access to a computer. In more modern times, the use of devices supported by networks and networks have facilitated long-distance home management. In order to control electronic devices, this form of system normally uses SMS or the net. This query, however, is also available. This paper aims to use a blinking sensor to disassemble their retrieval. The blink sensing element is an electronic device that can hear the glow of the eye and, when attention is closed, provides the corresponding output power. This system contains a GSM module-related alarm that notifies you at all times.

II. EXISTING TECHNOLOGIES

A. Brain-drive: a smart driver that uses cognitive command for managing digital appliances

[9]The atmosphere of the Cerebrum PC device has opened another sky for people with disabilities and vulnerabilities to live a life that is helpless and uncontrollable. However, in a significant part of the world, the use of artificial appendages and counterfeit organs are not yet financially viable. Some brain-based structures are often expensive, powerful, or allocated towards the end of time. To solve these problems, we have focused on building a small effort control unit such as a pen-drive into a specific brain drive that transforms human thinking into improved fruit signals. Some mutations (mental functions) with sharp eyes (neural-driven effect) create a certain ability to perform the task, regardless of whether the eyeballs are undeniable, creating significant differences in electroencephalogram (EEG) or signaling. From the previous call, a single EEG signal is collected and the reported EEG data is processed and distributed over time to minimize the impact of the uproar and complexity of the past. The lattice of the cells is displayed on the screen before the title, which is associated with a built-in structure in an area accessible to each computer's harvest rod. The client simply needs to look at and perform an eye-saving cell-saving squint, which can be separated from a dirty brainwave count without much stretching. Since the glare of the eyes can be both visible and automatic, keeping the strategic distance from the unpleasant, fixed ones that catch the eye of the most repetitive distractions is dismissed. Brain Drive captures the flicker signal instead of the visual animation yield, not at all like the locator-based eye squint locator.

[10]B. Efficient eye flicker recognition technique for debilitated helping area:

Facial loss of movement causes patients to lose their facial growth, as patients are not prepared for squinting, which can cause eye injury and even vision impairment. We plan and upgrade a few genius iBlink glasses to support patients with facial loss of motion flicker. The critical idea is to use a camera to film the normal side of the face and animate the deadened side, so that the squint of both eyes becomes symmetrical.

III. BLOCK DIAGRAM

Here is the block diagram of our system, we divide our system into two parts:

Transmission side of our proposed system: (Fig 1)

Here we have an IR sensor, Controller i.e., Arduino UNO and a RF ID Tx module.

Receiver side of our proposed system: (Fig 2)

Here we have a RF ID Rx module, Relay and our home appliances.



Fig. 1. Transmitter portion of our proposed system



Fig. 2. Receiver portion of our proposed system

1. IR sensor :

Infrared sensors are electrical sensors that detect infrared light (IR) emitted by objects during the viewing process. They are often used in motion sensors designed for PIR. These sensors are widely used in security system and lighting systems. When an object approaches the sensor, the Light emitting diode produces an infrared light, which is detected by the receiver.

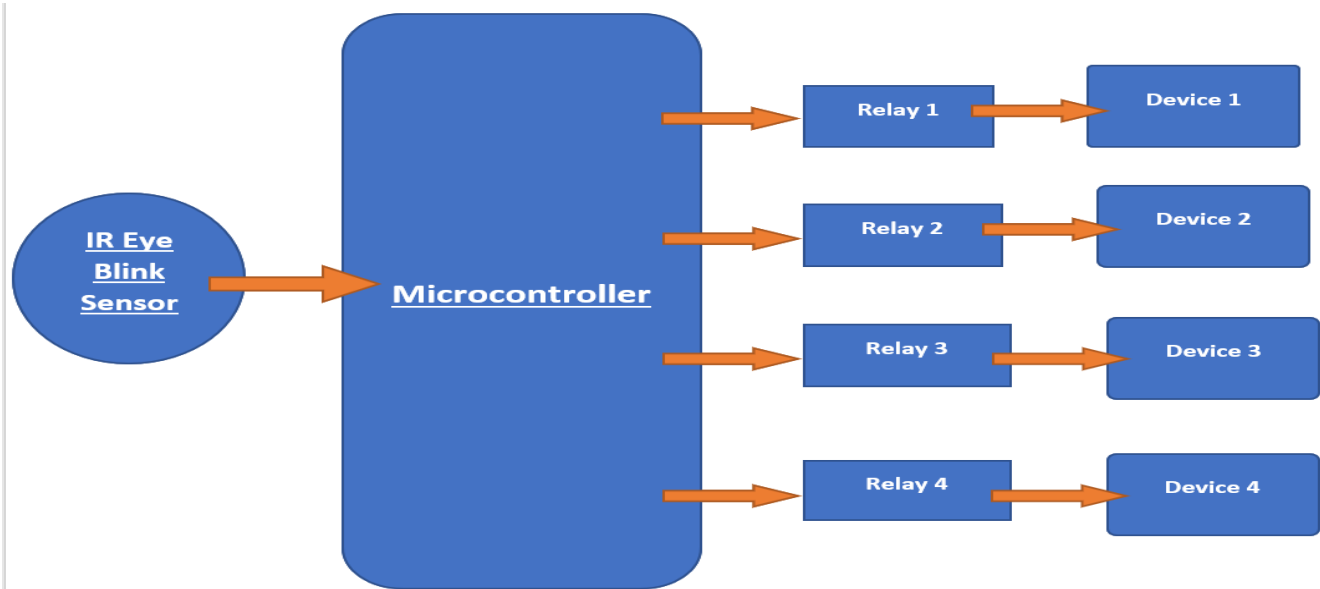
2. Arduino Uno :

It is a microcontroller board that runs on an open source platform which is ATmega328P microcontroller and discovered by Italian company called smart projects. This board has a various collection of digital pins and analog input - output pins that can be connected on various other circuits. The board has total fourteen digital input output pins (six PWM output), six analog I/O pins, and is configured via Arduino IDE. The Arduino Uno operating voltages is 5 volts. It is very simple to use and helpful in making electronics project. It requires simple piece of coding.

3. RF Transmitter and Receiver :

To send and receive data, the RF transmitter module will often operate in pairs, requiring a Transmitter and a Receiver. The transmitter can only send data to the recipient and the receiver can only receive it, so data can only go from one end to the other.

As shown above, the Transmitter module has three anchors: Vcc, Din, and gnd. The input range for the Vcc pin is 3V to 12V. During transmission, the transmitter uses a



minimum current of 9mA and can raise to 40mA. The centre pin is used to transmit signal data. This signal is computed using ASK and transmitted at a frequency of 433MHz over the air.

As shown above, the RF reception module has four anchors: Vcc, Dout, Linear out, and Gnd. A 5V-controlled supply should be used to power the Vcc pin. This section's running period is less than 5.5mA. To get a 433Mhz signal in the air, the Dout and Linear out pins are squeezed together. To receive data, this signal is lowered and sent through a data pin.

4. Relay Module :

An electromagnet drives an electric motor in the power transmission module. A low-power signal that varies from a small control opens the electromagnet. The electromagnet pulls or switches off the electrical circuit when it is triggered.

A telephone coil wrapped with a soft metal coil, or solenoid, a metal yoke bringing a low magnetic field, a moving arm's arm, and one or more contacts make up a simple transmission. A portable weapon is a yoke with one or more moving sets of contacts connected to it. The arm becomes trapped in the spring, leaving a gap in the magnetic circuit where the relay is active. One of the two contact sets is closed while the other is open while in this location.

As electrical energy is transmitted through a coil, a magnetic field is created, which allows the gun to function. The fixed contact is created or disconnected as the moving contact moves. The contact sets were previously closed, opened, and broke the connection when the transfer no longer works, and vice versa when the contacts are open.

IV. Methodology

[3]This is the most basic diagram in the figure. In real time, the blinking sensor is used to transfer the applied input as well as provide the microcontroller with the required control signals. The microcontroller board is used to monitor the equipment and makes the appropriate decision based upon various sets of inputs and outputs.

The microcontroller is utilised to check the blink sequence's accuracy, using the current IC driver to transfer open equipment. A 12v adaptor is used to provide the constant supply to ICs and transmits. LEDs are used to indicate the state of a system discharge

V. WORKING

This system is divided into two parts, one is the transmitting side which will interact with the user and process that data then transmit it to the other side which is another part in which we have a relay system to operate the home appliances based on the user's command.

There are five main components in our system IR sensor, Arduino Uno, RF Transmitter, RF Reciever, and Relay Module.

[14]The IR sensor acts as an Eye Blink sensor, emitting IR radiation and detecting reflecting IR radiation. When the eye is closed, it emits high and when the eye is open, it emits low. The input is being sampled for 3 times per second and is categorised as short or long blinks based on the time taken for each blink. Since eight computers (equivalent to 2-3 machines) are running at the same time, three blinks are used to keep track of them. Blinking is short-sightedness when the eye closes more than 1/3 of a second and less than 2/3 of a second.

A long blink occurs when the eye is kept closed for Two-third of a second but less than a second. When the eye is closed, the timer is used to capture the exact instant. The number '0' (Logic LOW) is used for short blinks, while the number '1' (Logic HIGH) is used for long blinks. As triple input is needed to track equipment, the order of input will differ from "000" (Short three times) to "111" (long three times), binary equal to Zero to Seven octal. Each unit is measured and switched off / on depends on the browser. As the metal is taken, the pin corresponding to that function is rendered HIGHER.

Then the output from the IR sensor will be transmitted to the Arduino Uno which will process the data according to its programming, it will generate an output, that output will be passed to the RF Transmitter which will transmit the command to another side of the system which has an RF Receiver and a relay module which will on and off our home appliances. when the receiver receives the command and fed it up to the relay module which will process it and on or off the appliances according to the user's command.

VI. CONCLUSION

[14] This work is actually for patients with paralysis or with other disabilities. We put our efforts into this task so that they can manage their households and operate basic home appliances with ease. We also plan to improve this function with better eye blink sensor display features with an optical transducer, and provide opt-in power at any time when the eye is closed which will help the patient to control household and other things, for example, turn on/off the light, control fan speed and call for help. In summary, we want to say that this works using the Arduino Uno and the various sensors have been a great experience as we know a lot of important things. Our project will be especially useful for patients with disabilities and elderly residents. Although we are thinking about the type of project our model has been utilised and examined in order to exhibit it in actual world. One of the major aim of our project was to help the patient and make his or her life easier. Our plan will be realized when we can apply this plan in real life and people will benefit.

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