Assisting System for Paralyzed

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Abstract: The noble aim behind this project is to study and capture the Eye movement that is blink detection with IR blink sensor and used to controlling household devices. Which can assist paralyzed some of which even cannot move their hands and any other body part and can only moves eye or eyelid. The proposed system is controlled by human eyes . Therefore disabled person can control the Household devises by themselves.Most of the time this type of system works   in specific condition and does not work in a real time basis. but our system is a real time systemthrougha predefined number of eye blinks.also we have added some sensors to monitor some health parameters. and if suddenly parameter changes to danger level then sms is sent to doctor, relative of patient through sms.

Keywords: Eye blink, Health monitoring , Gsm, Sensors.

I. INTRODUCTION

Paralysis is defined as the complete loss of muscle function in any part of the body. It occurs when there is a problem with the passage of messages between the muscles and brain. Some paralyzed people cannot move even a single part of the body other than their eyes. Hence, the main aim of this paper is to design a real time system that can helpful the paralyzed to control appliances. through a   number of eye blinks. Image processing techniques are also used for detecting the eye blinks. In our system, the face tracking is done by using eye blink sensor which is   IR based sensor. which reflects from eye's surface and threshold is generated. With which the devices are ON/OFF Initially, the involuntary blinks of the paralyzed person are used to locate the patient's eyes by finding the number of connected components in a frame. Once the eyes are detected by checking time for which eye is blinked,.

In these days electronic devices are improving day by day and there demand is also improving. Smart phones, tablets are example of this. The system detects the eye blink and differentiates between an intentional   long blink and a normal eye blink. Here one eye blink of one eye is required to ON one appliance This system can not only be used to save electricity, but also to help paralyzed patients to lead their own life without anyone's help. Tetraplegia is a condition where people cannot move parts below neck. The proposed system can be used to control two appliances simultaneously. where one eye is used to control one device like bulb and other eye's blink is used to control second device like alarm bell.

In this system simply ARM processor is used, and embedded language is used and matlab or image processing is not used therefore this system's efficiency and accuracy is more. today PC's outdated. So here there no need to use pc for functioning or visualise the waveforms generated by sensor so simple hardware is used to assist the paralyzed people. and smart automation system is builded by this. And also in these project constant patient monitoring system is added for helping fully paralyzed people which consists of various sensors. These sensor values are processed by arm controller and if specific value of body parameter is changes from its ideal value and goes to danger level then sms is sent to patients relative or doctor through gsm. So this system is highly useful for paralyzed people.

II.LITERATURE SURVEY

* According to a survey, nearly 1 in every 5000 people are paralyzed. Fully paralyzed patients require 24 hour support. But in this days, it is not possible to constant monitor patient.
* So they need a person which take care's movement disabled or paralyzed patient.
* And appliances cannot be handled by them. So they need constant help and they cannot work independently
* There are various applications which can be drive from eye blink detection and these are not limited.
* An efficient, real time blink detection can be used for almost any purpose. It can be used for on/off appliances such as lighting devices, fan, television or a microwave oven.

* It can also be used to send a messages. Or call someone on mobile phone. All this can be done with just a few eye blinks. No. of techniques have been devised for face tracking. Can Shift face tracking algorithm, face tracking algorithm and face tracking using Eigen faces are some of these.
* There are some techniques used for blink detection as well. In some of them are software is used i.e. using image processing, and in few hardware is used consisting sensors.
* in hardware based systems normally infrared and magnetic sensors are used .The main advantage of using sensors is that the entire system would be more simple, compact and light weight. Though risks are present in this technique this system is very efficient.

Primary Purpose of this system -
The primary purpose of this is to propose a system that can assist the paralyzed. It does by using IR based eye blink sensor. And and long blinks of eye are used to control the appliances efficiently.

There are number of techniques -
- though a various techniques have been developed for eye blink detection, there is no application that is developed to use the blink detection in practical use. The main contribution of this project is the this techniques are implemented for assisting paralyzed patient
- matlab processing is also used for developing same system but is is not efficient and not real time.
- EEG or EOG based techniques are also present in these days but there accuracy is very low also complex circuitry is present with no. of electrodes which are mounted on patients head. So it is very complex and should not be used for implementing this type of systems.

So in our system IR based eye blink sensors are used which are mounted on goggle and that goggle is used for controlling devices

III. DESCRIPTION

1. BLOCK DIAGRAM DESCRIPTION
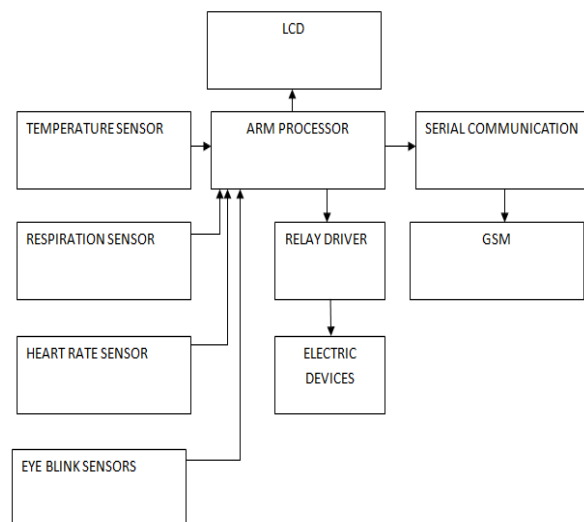The system can be represented using block diagram as shown below.

Fig 1. Block diagram of whole system

1. *ARM-7 module* - In our system we are using LPC2148. It acts as the major controller unit of the system. Input from various sensors like IR blink sensor, Heart rate, Temp ,respiration sensor is given to this unit on which it process according to the programming and gives output to the relay driver circuit, and to gsm module It needs 3.3V to drive the ARM7 module.

2. *Power supply unit*- On-board 9V 500mA transformer is used in which 230V Primary and 9V secondary is used. for designing power supply we have bridge rectifier, filter,

7805 voltage regulator, LM 1117 IC generates Constant 3.3V O/P needed to drive ARM module.

3. *Power on reset* - for power reset this circuit is used where 22k resistor, 0.1 µf capacitor and 1diode for noise suppression is used for reset the power circuit.

4. *LCD Display*- 16X2 characters display is used in system for displaying health parameters.which constantly displays body parameters.

5. *Blink Sensor* - The blink sensor used here is an IR based blink sensor which is for eye blink detection gives an output of 0V (Logic '0') when the eye is open and gives +5V (Logic '1') when the eye is closed. Its o/p is given to digital inputs of ARM processor.

6. *Sensors* - various sensors are used in this system like and respiration/gas , LM35 temp, Heart rate sensors are used for health monitoring of patient. which very useful sensors in critical monitoring of patient

7. *Relay* - for driving home devices we have relay driver unit
In which two 12V cube relays and relay driver IC uln 2803 is used for driving devices.

8. *GSM* – we have used SIM800 GSM module which is faster one than SIM300 and 900.if body parameters changes from its ideal range then sms is given to doctor for that it is used.so with the help of which patients relative can constantly get activity of their patient.

Components List
- LPC2148 controller
- IR eye blink sensors
- Respiration/gas sensor
- LM 35 Temp. sensor
- Heart rate sensor
- 12V Cube Relays
- Uln 2803 Relay Driver
- 16 x 2 Character LCD
- SIM800 GSM module

Software's Used
- Keil Micro vision 4
- Proteus 8

2. WORKING
This System divided into two major parts home automation system and constant patient monitoring system. in which automation system consists of three major sections namely the blink sensor, ARM controller board, and the driver Circuit. The eye blink sensor is an IR based blink sensor. If the eye is closed ,it means the output is high otherwise the output is low. Here the input is sampled two times per second and depending on the time taken per blink; these input blinks are classified as a short or long blink. Since two appliances are controlled simultaneously. here one eye is used for controlling one appliance and other is used for controlling second

appliance. a goggle is developed for patient for perfect and constant eye blink detection.

And after that we have developed a constant patient monitoring system in which some sensors respiration sensor, heart beat, and temp sensor is used.

1.Temperature sensor

Fig 2.Temperature sensor

In this system we have used LM35 temperature sensor. Which is simple three Pin sensor. Which directly calculate temp in Celsius. Amplified output is easily given by this temp sensor. It is of low cost. its accuracy and sensitivity is higher than other sensors. And its cost is also low.it does not needed any caliberation or trimming. this is the main advantage of using this integrated sensor.

2.Respiration/gas sensor

Typical respiration sensors are available in market which are used are attached to stomach portion of patient. which Is notThat much useful.

Fig 3. Respiration/Gas Sensor

Respiration sensor is useful for calculating breathing responses of patient. It is simply gas sensor which measures concentration of carbon dioxide in successive breathing.and its amount is high then sms is given to patients relative through gsm. In this project simply one breathing mask is attached sensor. generally respiration sensors are costly and their assembly is also complex .But this is new idea we have developed due to which accurate and ideal respiration rate is calculated.it is very useful in critical monitoring of patient.

3.Heart rate sensor

Heart rate sensor can easily developed with using on IR led transmitter and receiver on same side of finger. The pulses and voltage sense by receiver is used for calculating heart rate. this is simple tip sensor attached to finger of

patient. And if heart rate is above or below the desired range then data is processed and sms is given to patients relative or doctor.

Fig 4. Heart rate sensor working diagram

4. IR Eye Blink Sensor

Fig 5. IR Eye Blink Sensor pair

Fig. shows IR eye blink sensor pair which we have used in our sysem. Which consists of IR transmitter and receiver which is mounted on goggle. On At least 15mm distance.IR rays reflect fully when eye is closed and logic '1''is generated and when eye is open IR rays are absorbed by some amount and logic '0' is generated. When logic 1 is generated device is ON.we can control one device with the help of one eye. Sensitivity pot is used in tis sensor with which sensitivity can be increased or decrease.

IV. ADVANTAGES

- Highly flexible
- Quick response time
- Real-time application
- Reduces the human activity
- Complete patient monitoring
- Highly secured
- High accuracy

V.CONCLUSION

This IR based home automation system is smart, secured and real time system serves as a reliable and efficient system for paralyzed people for controlling home devices like fan,tv etc . The system is inexpensive, simple and dependable assembly. This system provides the ability to operate devices without anyone's help. also it monitors patients health parameters so patient does not needed to go hospital for their normal parameter checkup .this system provides it simply and also if the body parameters are changed suddenly from their ideal ranges and goes in danger zone then sms is immediately sent to patients

relative or doctor for critical care so it provides a complete care unit for paralyzed patient.

VI. FUTURE WORK

The future scope of project In future the system can be made more smart and efficient by making the goggle wireless for eye blink detection. It can be made by using Bluetooth and Wi-Fi technology. so as to Make system efficient and secure as well as easy to handle. Also for constant patient monitoring some indications for security can be added like buzzer or light indicators. Also instead of using Gsm we can use zigbee module to monitor patients parameters on pc in case of if patient is in hospital. So it becomes useful in hospitals for continuous monitoring of body parameters on doctor's pc or main pc of hospital ward.

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