



IOT Based Message Conveyor system for Paralytic/Disabled People

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Abstract : During a search we found the statistics of disability population in our country. So, we came to know that the count of physically disabled people is very high. That's why we decided to do this as our project. The main aim of the project is to implement a low cost reliable system which will help to establish communication between disabled patients and nurse/Loved ones. We are using an accelerometer and IR sensor as the main part of our project. The accelerometer device which is used to detect the motion. We will put the accelerometer on any movable body part of person who is physically challenged. If he got some problem, he will move the body part which contain accelerometer in particular direction as per the programming. Device will detect the motion and will give an output signal to the Arduino Uno. Arduino will detect input as per the programming done for the direction of accelerometer. Same the IR sensor also works on the principle of number of blinks. The number of blinks decides the type of message which is processed by the Arduino Uno. After detection of motion/blinks it will give output in multiple forms i.e. Message in telegram, LCD display with buzzer alert and storage same message in cloud as per the program. The nurse/loved ones will get alert by any of these form and attend the particular patient. Our project provides a reliable, effective and simple yet important solution to various issues faced by nurses in traditionally communicating with disabled patients.

Keywords: Arduino(ATmega328P), IR Sensor, Accelerometer(ADXL335).

I. INTRODUCTION

Across hospitals and NGOs disabled people are not capable of full-body movement as compared to a normal person. In such a situation we propose a system that helps disable person to convey his needs/emergency by just simple motion of any part of his body or eye. Movement of the hand in a particular direction and number of eye blinks will send a particular message to be communicated

Among the large number of advancement in the medical sector, very few actually focus on helping patients with disabilities to communicate. Although monitoring systems make it easier for doctors to collect and observe a patient's vitals the main purpose is to replace the conventional approach of patient-nurse communication with modern technologies that provide a much faster and reliable way to do so. In the current scenario, the patient has to be dependent on a family member or mostly a nurse both of which have to attend to the patient constantly. Objective of this method is to make such patients independent to communicate with the nurse by the simple task of tilting a device located on his finger or any other part of the body that is capable of movement. After the patient sends the message the nurse can remotely monitor their requests and provide assistance without any further delay. Nowadays lot of techniques has been devised for sensing the hand gestures & doing the appropriate actions. A technique based on glove is a popular mode of recognizing hand gestures. It uses a motion sensor attached to a glove that detects hand

movements and IR sensor attached to eye glasses detects the number of eye blinks and conveys the particular message to the output devices.

II. EXISTING SYSTEM

There are many existing devices/systems out of which some relevant systems we have gone through during the finalisation of this project i.e.

- i. Tongue motion-based operation of support system for paralyzed patients which is a new control device based on tongue motions to control and communicate with a support system for a paralyzed patient. Here they focus on the tongue movements as one of output of human intentions.
- ii. Exoskeleton to replace Paralyzed Arm based on healthy Arm Guidance. In this method we discuss the stroke rehabilitation based on the patient's self-guided control, by robotic device and a novel exoskeleton. It is realized by moving the patient's own healthy arm in order to provide movement trajectories for the exoskeleton.
- iii. Head Gesture Based Control of Wheelchair for a Paralyzed Person in an Indoor Environment. This method implements & develops a wheel chair control for the physically challenged by employing head gesture recognition using MEMS technology

III. PROPOSED SYSTEM

The proposed system consists of accelerometer and IR sensor. It is the device that is used to detect the motion and eye blinks. We use accelerometer on any movable body part of the person and IR sensor to the eye of a person who is physically challenged. The main purpose is to replace the conventional communication approach of patient-caretakers with modern technologies that provide a much faster and reliable way to do so. If a person is in state to convey then they will move the body part or blink their eye and messages are sent to output devices as per the programming. The device will detect the motion and number of blinks will give an output signal to the Arduino Uno. The Arduino Uno will detect and give output in multiple forms i.e. Message in telegram, LCD display with buzzer alert and storage same message in cloud as per the program

IV. COMPONENTS REQUIRED

Name of the Component	Quantity
Arduino(ATmega328P)	2
IR Sensor	1
Accelerometer(ADXL335).	1
RF transmitter	1
RF receiver	1
Power regulator	2
Wi-Fi module(E58266)	2
LED display & Buzzer	1 each

V. BLOCK DIAGRAM

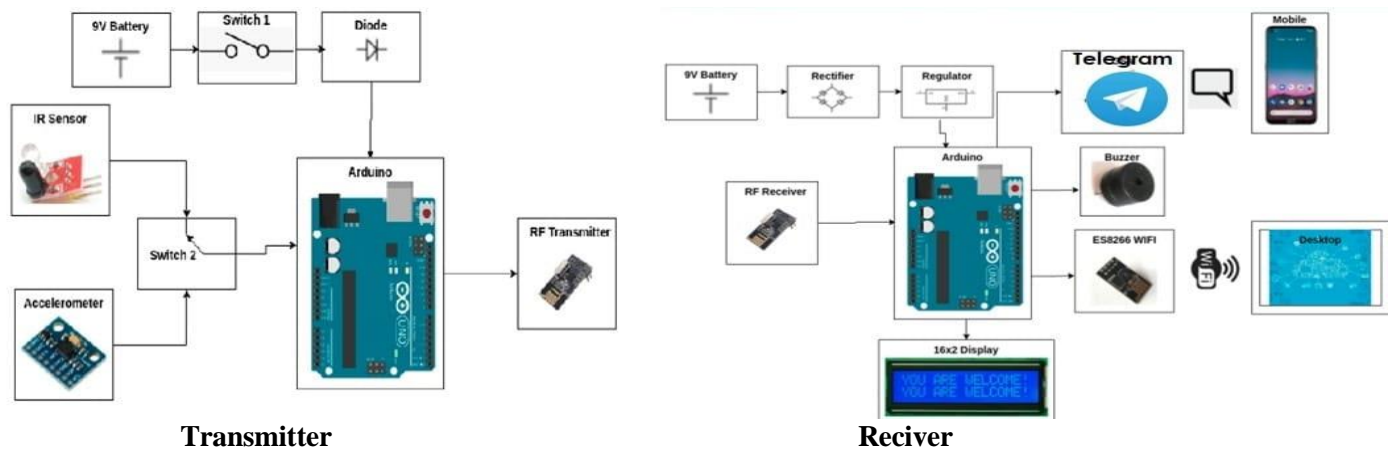


Figure : Block Diagram

VI. WORKING PRINCIPLE

The accelerometer + gyro sensors are used to produce the analog input when there is a linear motion in any direction. There is an prescribed message for each direction. This signal is processed by the microcontroller.

IR sensor module is used for detection of the eye blinking . The IR sensor module consists of IR transmitter & receiver, op-amp, variable resistors and output LED. Patient will blink his eyes for a long 3secs and blinking system from which the input data is generated. This data is processed by the microcontroller. The switch has been used for switching purpose between motion sensor & eye blinking to the Arduino. The microcontroller used here is Arduino Uno which is 8bit atmega328p MCU IC with an operating voltage of 5v. It process the digital data obtained from motion and IR sensor. The same data is further transmitted to RF transmitter which has 2GHZ frequency and 200feet range.

RF-Receiver (NRF24L01) feeds the input signal to Arduino Uno through 4 digital input pins

The Arduino processes the signal and provides the output in three different modes through digital and Tx and Rx

New Nodemcu module send message to mobile using telegram app.

OLED Display show the user requested message

Buzzer alerts the person near the module about the message

Finally storing all the data in cloud through WI-FI module (ES8266) which helps user to access all the data from cloud through any desktop by entering user id and password

The Switch is operated manually to provide feedback for the processor

VII. ADVANTAGES

- i. Diable people can easily communicate with other people and ask for help if they need
- ii. They can directly contact to the doctor or nurse if some health-related problem is occurred.
- iii. Secured and reliable communication

VIII. APPLICATIONS

- i. Hospital for communicating with doctors and nurses.
- ii. Home for communicating with family members.
- iii. For asking help to others who is present near the receiver module

IX. CONCLUSION

This device has made conveyance of message possible only by the motion of a body part. The ease of message conveyance is the main advantage of this system along with the real time user defined medicine alarm. By implementing this system a simple device for paralyzed or disabled people can be achieved without the use of complex form of inputs. The prototype we have made is fully functional but restricted to a small area of operation. For a large area and transmission distance the type of communication used have to be more effective and faster. Our system successfully proves that this system is an excellent

approach to be implemented at hospitals for patient-nurse communication. The project can be further developed into an automatic wheel chair wherein the wheelchair will be moved just by hand gesture. Also, along with only message transmission other data like body temperature, pulse rate etc. can also be transmitted to the nurse so that a real time record of all the patients is maintained.

X. REFERENCES

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