



e-ISSN: 2319-8753 | p-ISSN: 2347-6710

IJRSET

International Journal of Innovative Research in
SCIENCE | ENGINEERING | TECHNOLOGY



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

Volume 12, Issue 12, December 2023

ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA

Impact Factor: 8.423

9940 572 462

6381 907 438

ijirset@gmail.com

www.ijirset.com

Design of Assisting Device for Partially Disabled Patient using IoT

Sadiq Basha.G¹, Sujatha.P², Gandhimathi.V³, Uthaya.G⁴

Associate Professor, Department of Electronics & Communication Engineering, V.R.S College of Engineering & Technology, Villupuram, Tamil Nadu, India¹

Associate Professor, Department of Electronics & Communication Engineering, Kingston Engineering College, Vellore, Tamil Nadu, India²

Associate Professor, Department of Electronics & Communication Engineering, V.R.S College of Engineering & Technology, Villupuram, Tamil Nadu, India³

UG student, Department of Electronics & Communication Engineering, V.R.S College of Engineering & Technology, Villupuram, Tamil Nadu, India⁴

ABSTRACT : The IoT based paralysis patient assist system is a system designed to help the patient convey various messages to doctors, nurse, or his/her loved ones sitting at home or office over the internet. When pulse rate goes abnormally very low, intimation will given to the doctor and their caretakers immediately. The system makes use of a microcontroller based circuitry to achieve this functionality. It makes use of a hand motion recognition circuit and a receiver plus transmitter circuit. The hand motion circuit is used to detect hand movements using accelerometer + gyro , Pulse rate sensor sense the heart rate and then transmit this information wirelessly over RF to the receiver system. The receiver system is designed to receive and process these commands and display them over the LCD display as well as transmit the data online over to IoT gecko server. The IOT gecko server then displays this information online, to achieve the desired output.

KEYWORDS: Blynk server, ARDUINO, Flex sensor, SPO₂,

I. INTRODUCTION

Paralysis is the inability to move muscles on your own and with purpose. It can be temporary or permanent. The most common causes are stroke, spinal cord injury, and multiple sclerosis. Paralysis can be a complete loss of movement known as a significant weakness called paresis. Paralysis is most often caused by damage in the nervous system, especially the spinal cord. Paralysis is caused by injury or disease affecting the central nervous system (brain and spinal cord) which means that the nerve signals sent to the muscles is interrupted. Even though, there are innovative approaches for curing or treating paralysis patients, but the aim of treatment is to help a person adapt to life with paralysis by making them as independent as possible. Normally these types of devices that are being developed is very large in size and expensive machines. They seem to be only available in hospitals and not able to be used at the patient's home or at their convenience. Our goal is to make a device that will be able to retain a patient's movement and they have been able to use the device themselves and also it must be cheap enough for them to afford without much debt. Because of long term disease, bring more cost for hospitalization and also to minimize the work of nursing staff required for continuous monitoring in medical institutions and in home, our proposed system give a replacement for reducing all these constraints.

Our project aims to develop new innovation for the use of basic nursing care. In this project, we introduce a secure IoT based paralyzed patient health care monitoring and facilitation system. It helps us to take care of patient health care without nurse.

NEED FOR PROPOSED SYSTEM :1. Disable people can easily communicate with other people. 2. If there are any suffocations to the patient, it is sensed in their earlier stage itself. 3. Intimated immediately to the concerned person 4. Disable people can ask for any help they need. 5. Secured and reliable communication.

II.METHODOLOGY

Some people are born paralyzed. Others develop paralysis due to an accident or a medical condition. Diagnosing paralysis is often easy, especially when your loss of muscle function is obvious. Paralysis can affect other bodily functions like breathing and heart rate. The condition can also involve other body systems in the affected area. If you have paralysis, you are partly or entirely unable to move the affected parts of the body. Paralysis may be accompanied by a loss of sensation depending on the location of the injury. This project helps the paralyzed people to convey their needs and health condition to doctors and their loved ones.

The project used the technology in telecommunication, where the evolution in telecommunication was applied in this project by using WIFI module ESP8266. At the same time, a few circuits and software are used to be a controller for all the main and sub equipment. A few components like microcontroller and wifi module are used. By using the flux sensor, it will aid the patient to convey anything that they want through the wifi module by sending message. The function of this sensor is that the patient just needs to move the body part to which the sensor is attached to convey a message. Besides this, the data will be displayed at the LED screen to know what the patient want to convey. On the other hand, the SMS alert will be sent to the care taker of the patient. The main aim of this project is to help paralyzed patient to convey their message or need.

Limitations of existing system: Someone has to check the display frequently and It only monitors the patient health.

III.WORKING METHODOLOGY

Our proposed system is used to monitor and assist the paralyzed patient. For that purpose, we used temperature sensor and heart beat sensor to measure the body temperature and BPM respectively. The normal temperature of a paralyzed patient shall be 98.6 F i.e., 37 C. If the range reaches above or below 98.6, it leads irrational thinking and health problems. This can be measured to know the rise in temperature. The normal heart beat range of a paralyzed will be nearly 60-100 beats a minute. If the range reaches below 60, it leads to heart block, syncope and when the range exceeds 100, it leads to anxiety and tachycardia. So, when it increases or decreases the status of the patient pulse rate will be intimated.

IV.BLOCK DIAGRAM

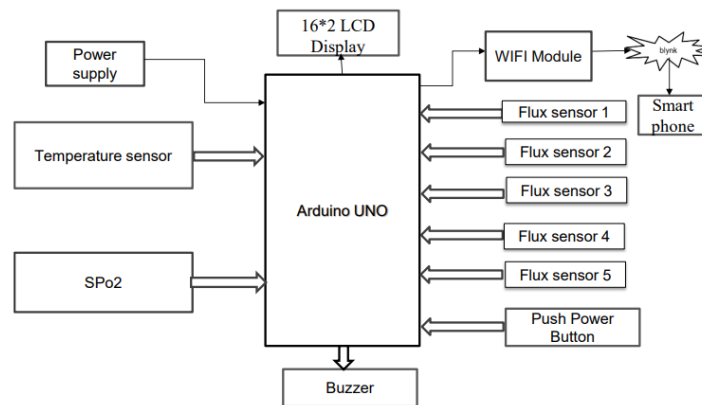


Figure No.1: Block diagram of Proposed system

V. WORK FLOW

The critical condition and any suffocation of the patient will be intimated immediately by using temperature and SPO₂ sensor. The use of flex sensor patient is able to interact with other people by regarding the specific gesture. To communication with the world flex sensor is connected to SDA and SCA pin of Arduino that is (A4SA5). It uses

I^2C communication mode. This sensor works on the bending strip principle which means whenever the strip is twisted then its resistance will be changed. This can be measured with the help of any controller. This sensor works similar to a variable resistance because when it twists then the resistance will be changed. The resistance change can depend on the linearity of the surface because the resistance will be dissimilar when it is level. When the sensor is twisted 450 then the resistance would be dissimilar. Similarly, when this sensor is twisted to 900 then the resistance would be dissimilar. These three are the flex sensor's bending conditions. According to these three cases, the resistance will be normal in the first case, the resistance will be double as contrasted with the first case, and the resistance will be four-time when compared with the first case. So, the resistance will be increased when the angle is increased. When the patient folds the flex sensor 1 indicates the value 'I need water', the flex sensor 2 indicates the value 'I need help', flex sensor 3 indicates the value 'I need lunch', flex sensor 4 indicates the value 'I need to go bathroom', flex sensor 5 indicates the value 'turn on/off household', Like that each sensor has an different messages to intimate the need of patient to the concerned persons.

To display the message according the gesture and the health condition of the patient here we patient here we use 10*2 LCD display 16-bit data is to be displayed is send through the pin (4,5,6,7) from the Arduino. Further to notify the patients' health to their family member and other loved people we have send the data into internet server. For this purpose, we have used ESP 01 Wi-Fi module which BLYNK server where outer family member, doctors can easily access the patient health condition in their smartphone from any part of the world.

System description:

ARDUINO UNO: Arduino is an open-source electronics platform based on easy-to-use hardware and software. Arduino boards are able to read inputs - light on a sensor, a finger on a button, or a Twitter message - and turn it into an output - activating a motor, turning on an LED, publishing something online. You can tell your board what to do by sending a set of instructions to the microcontroller on the board. To do so you use the Arduino programming language (based on Wiring), and the Arduino Software (IDE), based on Processing. Over the years Arduino has been the brain of thousands of projects, from everyday objects to complex scientific instruments. A worldwide community of makers - students, hobbyists, artists, programmers, and professionals - has gathered around this open-source platform, their contributions have added up to an incredible amount of accessible knowledge that can be of great help to novices and experts alike. Arduino was born at the Ivrea Interaction Design Institute as an easy tool for fast prototyping, aimed at students without a background in electronics and programming. As soon as it reached a wider community, the Arduino board started changing to adapt to new needs and challenges, differentiating its offer from simple 8-bit boards to products for IoT applications, wearable, 3D printing, and embedded environments.



Fig.No.2: Arduino board

ESP8266 : The ESP8266 module enables microcontrollers to connect to 2.4 GHz Wi-Fi, using IEEE 802.11 bgn. It can be used with ESP-AT firmware to provide Wi-Fi connectivity to external host MCUs, or it can be used as a self-sufficient MCU by running an RTOS-based SDK. The module has a full TCP/IP stack and provides the ability for data processing, reads and controls of GPIOs. The chip was popularized in the English-speaking maker community in August 2014 via the ESP-01 module, made by a third-party manufacturer AiThinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at first, there was almost no English-language documentation on the chip and the commands it accepted.[2] The very low price and the fact that there were very few external components on the module, which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, the chip, and the software on it, as well as to translate the Chinese documentation. The ESP8266 uses a 32bit processor with 16 bit

withdrawing blood from an artery in the wrist, elbow, or groin. You may feel a sharp pain when the needle enters the artery. The blood is put in an ABG machine (blood gas analyzer) that provides blood oxygen level readings in the form of the partial pressure of oxygen (PaO₂). In clinical studies, the blood oxygen level measurement feature on the Apple Watch has shown good accuracy when compared to a traditional pulse oximeter, which is a device commonly used to measure blood oxygen levels.

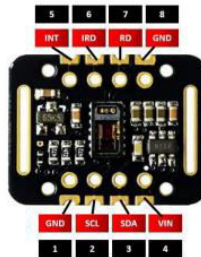


Fig.No.6: SpO₂ Sensor module

LCD DISPLAY: The term LCD stands for liquid crystal display. It is one kind of electronic display module used in an extensive range of applications like various circuits & devices like mobile phones, calculators, computers, TV sets, etc. These displays are mainly preferred for multi-segment light-emitting diodes and seven segments. The main benefits of using this module are inexpensive; simply programmable, animations, and there are no limitations for displaying custom characters, special and even animations.

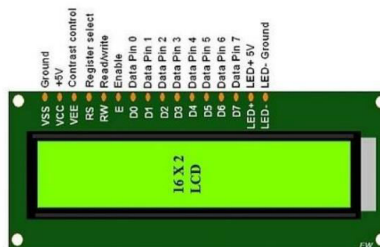


Fig. No.7: LCD pin diagram

INTERFACING UNIT: Ac to 12v dc power supply is the most used and common circuit. There are so many applications of AC to DC converter Project. The 220v to 12v dc power supply is build to convert AC input to 12 volt DC output. The ac to dc converter project is useful for fixed DC applications like DC motors, pumps, Chargers and many other applications. Here we are going to discuss the what is a dc power supply and circuit for power supply for 12 volt output.

The high current dc power supply is quite simple to test and build. This AC to DC converter Project of Power supply is a beginners level circuit for basic electronics projects. We are going to define how to make a 12v power supply. The circuit can be used with many useful applications as it draws 2-A Current. The ac to dc converter project is the best approach to make this easy and simple power supply project. This is a 12V DC adapter circuit.

VI. RESULT

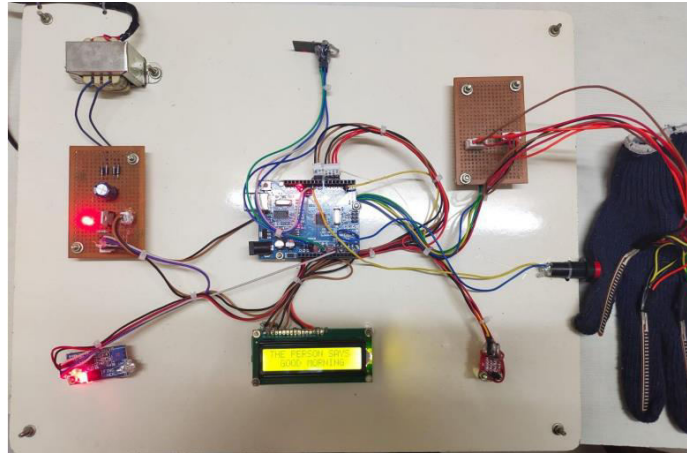


Figure No.8 : (a). Photocopy of Proposed system



Figure No.8 : (b). Output of flux sensor

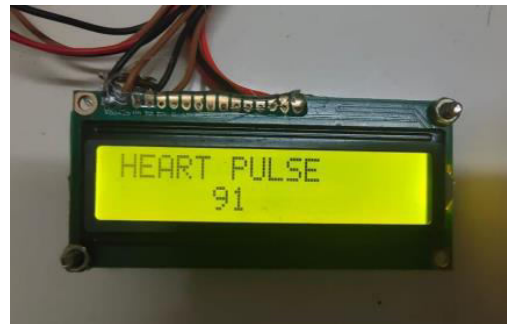


Figure No.8 : (c). Output of pulse sensor



Figure No.8 : (c). Output of pulse sensor

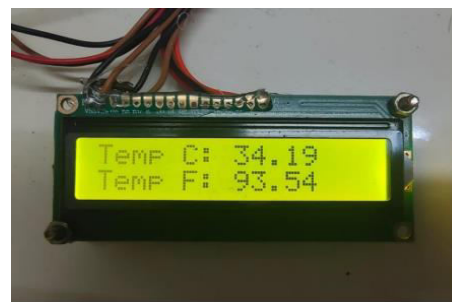


Figure No.8 : (d) Output of temperature sensor

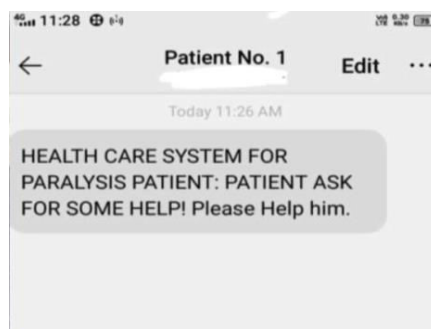


Figure No.8 (e) Message sent to the concerned person

VII.CONCLUSION

Our paralysis patient healthcare system using IoT bridges the gap between the partially paralysed and physically challenged patient and others through simple gestures for communication and helps the paralyzed patient to relieve their stress by revealing their thoughts and help them as much as possible. And this system is cheap enough to afford without much debt and is useful also. The critical condition or unconscious state of the patient is intimated immediately, so treatment can be given as soon as possible. Thus, the Paralysis patient can be taken care without someone beside them all the time. It will be useful for the concerned person who take care of the patient, lead his day-to-day life normally without thinking about the patient.

REFERENCES

- [1] Sanket Kad, Aishwarya Joshi, Shital Bajgude, Dhanashri Naiknawre “IOT Based Paralysis Patient Healthcare”, 2022.
- [2] Mubeen Aslam Momin, 2Nutan Suresh Bhagwat "A Secure IoT-Based Modern Healthcare System Using Body Sensor Network", 2017.
- [3] Lin Yang; Yanhong Ge; Wenfeng Li; Wenbi Rao “A home mobile healthcare system for wheelchair users”, 2019.
- [4] Mari Carmen Domingo “An overview of the Internet of Things for people with disabilities”, 2011.
- [5] Fang, Xiang et al: An extensible embedded terminal platform for wireless telemonitoring, Information and Automation (ICIA), 2012 International Conference on Digital Object Identifier: 10.1109/ICInfA.2012.6246761 Publication Year: 2012 , Page(s): 668 - 673.
- [6] Majer, L., Stopjaková, V., Vavrinský, E.: Sensitive and Accurate Measurement Environment for Continuous Biomedical Monitoring using Microelectrodes. In: Measurement Science Review. - ISSN 1335- 8871. - Vol. 7, Section 2, No. 2 (2007), s. 20-24.
- [7] Majer, L., Stopjaková, V., Vavrinský, E.: Wireless Measurement System for Non-Invasive Biomedical Monitoring of Psycho Physiological Processes. In: Journal of Electrical Engineering. - ISSN 1335-3632. - Vol. 60, No. 2 (2009), s. 57-68.
- [8] Goutam Motika, Abinash Prusty,” Wireless Fetal Heartbeat Monitoring System Using ZigBee & IEEE 802.15.4 Standard”, 2011 Second International Conference on Emerging Applications of Information Technology, 978-0- 7695- 4329-1/11 \$26.00 © 2011 IEEE DOI 10.1109/EAIT.2011.89.
- [9] Warsuzarina Mat Jubadi, Siti Faridatul Aisyah Mohd ahak”,Heartbeat Monitoring Alert via SMS”, 978-1-4244-4683-4/09/\$25.00 ©2009 IEEE.
- [10] Ovidiu Apostu, Bogdan Hagiu, Sever Paşca, Wireless ECG Monitoring and Alarm System Using ZigBee”2011 The International Symposium on ADVANCED TOPIC IN ELECTRICAL ENGINEERING2068-7966/ATEE 2011.
- [11] Dave Grundgeiger, Programming Visual Basic.Net, First Edition 2002, O’Reilly Publication, ISBN: 0- 596-00093-6, 464 Pages.



INNO SPACE
SJIF Scientific Journal Impact Factor
Impact Factor: 8.423



ISSN INTERNATIONAL
STANDARD
SERIAL
NUMBER
INDIA



INTERNATIONAL JOURNAL OF INNOVATIVE RESEARCH

IN SCIENCE | ENGINEERING | TECHNOLOGY

9940 572 462 **6381 907 438** **ijirset@gmail.com**



www.ijirset.com

Scan to save the contact details