

Gesture Based Health Care System Using IoT

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Abstract— The development is changing the area of the world and driving us towards a practical particular world. The rising piece of IoT has made a tremendous impact on human administrations. It improves the idea of care, constructs the patient security and data protection and farthest point working and administrative expense. The media transmission contraptions are more obvious and used by everyone around the world which has diminished the correspondence gap to a zero level. The paper explains a segment of the correspondence development and the specific shows for moving the data in a secured manner (i.e.,) how the basic signs of patients of patients of patients are sent to the restorative specialist for the further treatment. In our proposed framework we give two way help at whatever point a patient is in needs his normal need model, drug, water, nourishment or even any consideration from relative or medical attendant than his motion based notice raised with the data or they should be given to the patient. What's more, the second way is a programmed manner by which a sensor system to gauge the parameters will be consequently sends ready warning to specialist by utilizing IoT innovation if patient's wellbeing found basic condition. This 24x7 dynamic gadget will give specialists warning regardless of whether they were not in the clinic. Specialist can give help and treat crisis treatment to spare life.

Keywords: ARM7, Flex Sensor, RFID, Pulse Sensor, NodeMCU

I. INTRODUCTION

Health is a global priority because it becomes one of the key factors that influence the economic development and the welfare of a country, both for developing and developed countries. The adoption of information and communication technologies (ICT) within the healthcare sector led to the concept of electronics health (e-health) which is contributing to reduce costs and increased efficiency. Along with the development of technology, efforts to support health improvement had been done, one of them is to implement the concept of smart health. Smart health is a new approach to health monitoring process using advanced technology consists of smart devices, or usually called intelligent approach, to overcome health problems. In reality, the concept of smart health, e-Health, and m-Health cannot be separated. This research focuses on the design and development of mobile application as part of health information system named as MOOBLE (Monitoring for Better Life Experience). Hand and Eye gesture have been used in the past for performing daily activities for patients with disability. These gestures can consequently be used for controlling home appliances, security systems and alarms. These systems are, however, limited in several ways in their applicability. 'Wearable Multi-sensor Gesture Recognition for Paralysis Patients' presently designed, implementation, and evaluation of a multi sensor gesture

based home automation system. This system works on mentioned degree, rotation of the hand and eye gesture. One of the existing systems only transmits the vital parameters of the patients and the other helps the patients to do their work without any help and efforts.

II. EXISTING SYSTEM

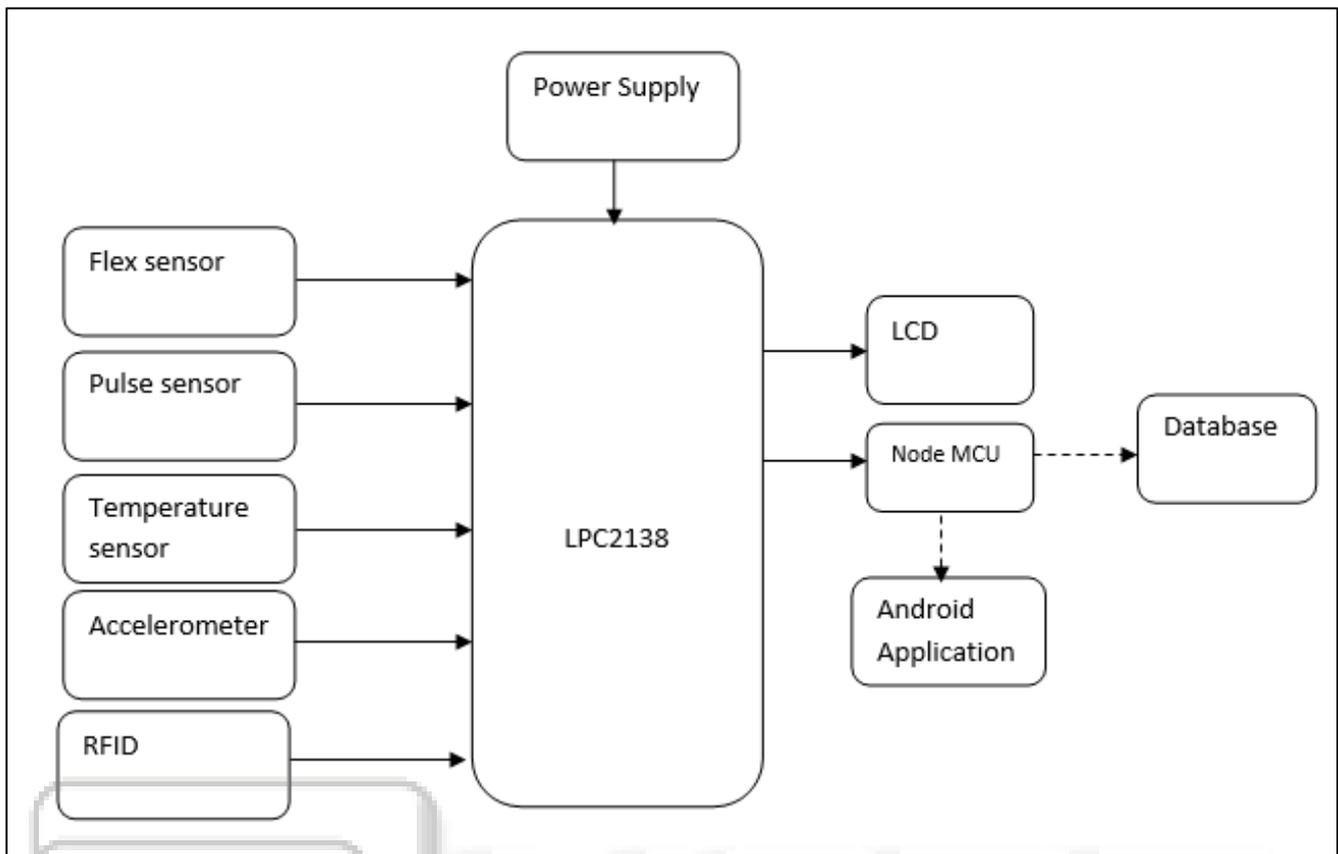
In the existing system available for the monitoring of the patients in the hospitals are either the manual monitoring system in which the nurse or the attendant will have to visit the patients after every fixed interval of the time. The nurse of will take the various parameter readings from the patients and hast the patient weather they need any type of the service like washroom, drinking water, or need food etc.

The second type of the existing system are semi-automated system in which the system is having the capabilities to generate the alert in the real time based on the condition of the patients health parameters like pulse rate, temperature or restlessness but these system are not able to propagate these alerts through the internet and the patients himself cannot generate any type of the alerts.

III. PROPOSED SYSTEM

In the proposed system we are using the various health monitoring parameters such as Pulse, Temperature, and Movements etc. and then we are sending the parameters remotely in the real-time via the website or the android application. In addition to this we are also adding the Flex sensor for the gesture based alert system for the patients, who will remotely alert the Doctor, or the nurse based on the requirement. The whole system is built using the Arm 7 based LP2138 controller which will collect the data from the various sensor attached to it, monitoring the health parameters, and then it will be transmitted remotely to the database using the Internet and can be accessed using the Website or the Android applications. We have proposed the system where both the monitoring the parameters and gesture based indication are given to fulfil the need of the patient at the time they need. These gestures indicate the authorized person according to the work the patient needs. This system is mainly designed for real time monitoring of the major vital parameters of the patients. The patient's vital parameters are transmitted to smart phones and laptops of the authorized person using a cloud server. This information can be stored and analyze for further analysis and decision making. By determining the pattern of the parameters which is observed, the nature of the health issues can be predicted. This system also discusses about fetching patients body temperature, pulse rate and restlessness using LPC2138 and cloud computing

IV. BLOCK DIAGRAM



V. HARDWARE AND SOFTWARE

A. LPC2138

The NXP (founded by Philips) LPC2138 is an ARM7TDMI-S based high-performance 32-bit RISC Microcontroller with Thumb extensions 512KB on-chip Flash ROM with In-System Programming (ISP) and In-Application Programming (IAP), Two 8-ch 10bit ADC 32KB RAM, Vectored Interrupt Controller, Two UARTs, one with full modem interface. Two I2C serial interfaces, Two SPI serial interfaces Three 32-bit timers, Watchdog Timer, Real Time Clock with optional battery backup, Brown out detect circuit General purpose I/O pins. CPU clock up to 60 MHz, On-chip crystal oscillator and On-chip PLL.

B. RFID

Radio Frequency Identification (RFID) is the wireless non-contact use of radio frequency waves to transfer data. Tagging items with RFID tags allows users to automatically and uniquely identify and register patients. RFID takes auto-ID technology to the next level by allowing tags to be read without line of sight and, depending on the type of RFID, having a read range between a few centimetres to over 20+ meters.

C. Flex Sensor

Flex Sensor is made up with carbon surface on a plastic strip when this strip is bend or deflect then the resistance of this flex sensor is changed therefore it is also called bend sensor There are two types of flex sensors are currently used in industry according to their size first one is 2.2 inch flex

sensor and second one 4.5 inch flex sensor. The resistance and size of both are different but working principle is same.

D. Temperature Sensor

LM35 is a precision Integrated circuit Temperature sensor, whose output voltage varies, based on the temperature around it. It is a small and cheap IC which can be used to measure temperature anywhere between -55°C to 150°C . It can easily be interfaced with any Microcontroller that has ADC function.

E. Accelerometer

An accelerometer is a device that measures the vibration, or acceleration of motion of a structure. The force caused by vibration or a change in motion causes the mass to "squeeze" the piezoelectric material which produces an electrical charge that is proportional to the force exerted upon it. Since the charge is proportional to the force, and the mass is a constant, then the charge is also proportional to the acceleration.

F. LCD

An LCD is an electronic display module which uses liquid crystal to produce a visible image. The 16×2 translates to a display 16 characters per line in 2 such lines. In this LCD each character is displayed in a 5×7 pixel matrix

G. Node MCU

NodeMCU is an open source LUA based firmware developed for ESP8266 WiFi chip. By exploring functionality with ESP8266 chip, NodeMCU firmware comes with ESP8266 Development board/kit i.e. NodeMCU Development board.

H. Embedded C

Embedded C is a set of language extensions for the C programming language by the C Standards Committee to address commonality issues that exist between C extensions for different systems. Embedded C programming typically requires nonstandard extensions to the C language in order to support enhanced microprocessor features such as fixed-point arithmetic, multiple distinct memory banks, and basic I/O operations.

I. Micro Python

MicroPython is a re-implementation of Python programming language targeted for microcontrollers and embedded systems like the ESP32 or ESP8266. Programming in MicroPython is very similar to programming in Python: all of the language features of Python are also in MicroPython, apart from a few exceptions. Because microcontrollers and embedded systems are much more limited than our computers, MicroPython does not come with the full standard library by default.

VI. RESULT

The output of the whole system consist of an hand gloves with three flex sensors attached to it which will identify the gestures for Food, Water, Nourishment, Washroom, Need Attention whichever be given by the patient. Temperature sensor LM35 to continuously monitoring the temperature of the patients, Pulse sensor which will monitor the heart rate of the patient continuously.

All the parameters data are sent to the small inbuilt microcontroller on the gloves which will transfer it to the server from where we have developed an web application which is able to run on all leading platforms i.e. Android, ios and windows. The data sent on the server can also be viewed in the web browser.

An email alert is sent in the real time to the doctor whenever any of the parameter in the patients goes beyond the threshold limits of the normal human conditions.

An additional sensor along with these all the sensor i.e. accelerometer is used to detect the motion in the body of the patient. If the patient is ideal for the longer duration then also an alert will pop up on the android application.

VII. ADVANTAGES

- 24x7 Monitoring of health condition
- Efficient monitoring of all patients
- Gesture based alert generation
- Cost efficient
- Saves Time
- Security
- Power efficient
- Less interference

VIII. CONCLUSION

In our module we have developed a system which will be 24X7 continuously monitoring all the vital parameters in the patient's body and will generates the alerts in the real time based on the health conditions of the patient as well as it

will be it also facilitates the patient to generate the alerts based on the service requirements arising from him. The service requests from the patients vary from food, water, and washroom or in some case to seek the doctor advices. This whole system will work in coordination with the existing system and provide a better monitoring and care of the patients. Thus, whenever the system is implemented it will help us to save more lives.

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