

Health Monitoring System Using Raspberry pi and Arduino

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Abstract— Regular great number of lives are effected on the grounds that the Patients are not right and within the law worked. in the same way, for constant parameter qualities are not through being able to keep producing measured in building and in addition in medicinal buildings." At times it gets to be troublesome for medicinal centers to as often as possible check patients' conditions. Likewise, constant checking of ICU patients is impractical. To manage these sorts of circumstances, our framework is helpful. The main purpose of this undertaking is to design and instrument true time state of being healthy looking at system using raspberry Pi. Here we are going to work that we will regularly monitored the patient health and also we will maintain the update of the patient health. In this we project used heartbeat sensor to check the patient health. Here we can calculate the readings of pulse rate, systolic, diastolic values. We can store the previous value of all these terms. This will help us to compare the health status of the patient. And easier way to recommend proper medicine.

Keywords: Raspberry Pi, Arduino, Systolic, Diastolic

I. INTRODUCTION

The big competitive world and new technologies are introduced new ways towards technology and automation. These technologies are also enhancing the human health caring systems. The people are busy in their day to day work in job or business, so they wants to ensure safety and care about their own health or their loved ones does matters in daily life. Due to busy life style or heavy work load people don't have time to take care of their health. So that the health issues increases day by. And the major disease reached on the top. No one have that much time to take care of their health or not for their relatives or family members. Can we get the middle way that will be help us to take care of our health and need not to spend access time for it. In this project, we plan the Health Monitoring System Using Raspberry pi and Arduino.

In this Raspberry pi and Arduino are the main controller. Also Bluetooth technology, Heart bit sensor are the important parts. In this project two main parts will be there of complete system that is transmitter and receiver. Transmitter will be with the patient and receiver will be with the doctor who far away from the patient. Here the heart bit sensor gives the instant readings of systolic, diastolic and pulse rate of the patient to the raspberry pi and then raspberry pi sends it to the Arduino. By this system patient will be under observation of the doctors even if doctors are not present on the patients place.

II. PROBLEM DEFINITION

For my project I have refer three papers in that papers to manage the health concerned issue systems in a cost effective way. In Health Monitoring system with embedded

computing can extract information from readings on heartbeat sensor without being with the patient unit. That's why for my project I am using raspberry pi as a receiver and Arduino as transmitter. Both the systems need not to be close to each other. That is advantage of my project. Here patient can be under observation for twenty-four hours even if doctor or relatives of patient are far away from him.

III. RELATED WORK

Healthcare of Human we work on Health Monitoring System Using Raspberry pi and Arduino. In our project The people are busy in their day to day work in job or business, so they wants to ensure safety and care about their own health or their loved ones does matters in daily life.

Due to busy life style or heavy work load people don't have time to take care of their health. So that the health issues increases day by. And the major disease reached on the top. No one have that much time to take care of their health or not for their relatives or family members. Can we get the middle way that will be help us to take care of our health and need not to spend access time for it.

Health Monitoring System in the system the main Application is there TELEGRAM we are using Telegram for the communication between patient and Doctor. We have created one GUI (Graphical User Interface) in the we mention all the detail of every patient that we are connected with it.

At any time human is there anywhere then also our device is activated with human if the health is in Under control then immediately the patient all detail and its pulse rate, systolic and Diastolic rate detail will sent to Doctor through the Telegram.

All the detail from the user GUI through the Telegram it sent to Doctor from this will know about heart attack, etc.

The human will know that thing early and he/she will take proper precautions on time.

From this we will save human health and save the time because time is the most important thing in our life.

IV. PROPOSED SYSTEM

The system of patient health monitoring can be mostly used in emergency time as it can be daily monitored, recorded and stored it as a database. In future the IOT device can be combined with the cloud computing so that the database can be shared in all the hospitals for the intensive care and treatment. The project works in by installing the project android application in the android phones. The application uses very less amount of space.

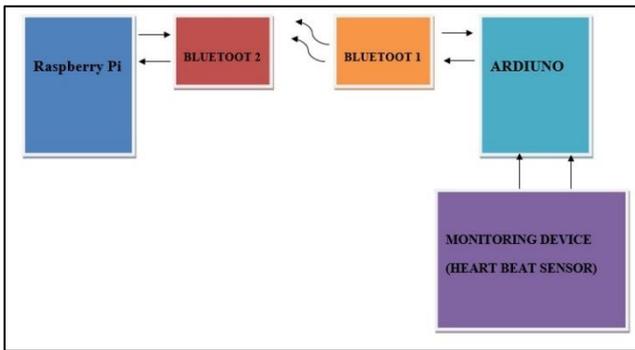


Fig. 1: Block Diagram

In this proposed work the vital parameters such as systolic, diastolic and pulse rate readings which are monitored using Arduino Nano. These sensors signals are send to Raspberry pi from Arduino via Bluetooth, so the Arduino Nano is used as transmitter and Raspberry pi used as receiver. Here patients systolic, diastolic and pulse rate is measured using respective sensors and it can be monitored in the screen of computer using Arduino Uno.

The proposed method of Health monitoring system monitors patient's health parameters using Arduino Uno. Hence, it has continuous monitoring of the patient's health by the doctor. Any abrupt increase or decrease in these parameter values can be detected at the earliest and hence necessary medications can be implemented by the doctor immediately.

A. Raspberry pi:

This is Raspberry Pi 2 model B is 6 times greater processing work then previous models. This is second generation Raspberry Pi model. The Raspberry pi is a small system which is designed in a single board with all the necessary components required for working on an operating system. The board has a micro USB port which can be used to supply 5V DC using an adapter with rating not less than 1A. The board can connect by using USB port but it does not do that. In the board it as HDMI port from that



Fig. 2: Raspberry Pi 2 model B

It will be connect to the HD TV by using HDMI cable. It as a video input port in a raspberry pi board which can also be used for connecting an external camera. The board can also be connected to the PC monitor using a HDMI to VGA adapter cable. The Raspberry pi board has a Dual RCA (PAL and NTSC) output which enables them to be connected directly to CRT TV screens and an audio output is also available. The board has two USB2 ports where the keyboard and mouse can be plugged in. There is

an Ethernet port which can be used to connect the board to a computer network. The Raspberry pi is designed to boot from the SD card and the board also has a SD card slot. The device using upgraded Broad com BCM2836controller chip which is an SoC (System on Chip). This controller has all the peripherals like timers, interrupt controller, GPIO, USB, PCM / I2S, DMA controller, I2C master, I2C / SPI slave, SPI0, SPI1, SPI2, PWM, UART0 and UART1. The SoC is the powerful ARM11 processor and it runs on 700 MHz at its core. The controller have Video Core, MPEG-2 and MPEG-4 and this is has a graphical processing unit (GPU). It also has a 512 MB SDRAM. In the Raspberry pi board it should also install the operating system version of Windows, Mac and Linux.

B. Arduino Nano:

Arduino is open-source hardware. The hardware context designs are presented under a Creative Commons Attribution Share-Alike 2.5 license and are available on the Arduino website. Of the hardware it is also available Layout and production files for some versions. Hardware and software designs are freely available, But the developer is telling that the Arduino is important and it is special product so anyone should not use it without any permission. The official policy document on use of the Arduino name emphasizes that the project is open to get together work by others into the official product. The project name by using various names ending in Arduino Several Arduino-compatible products commercially released have avoided it.

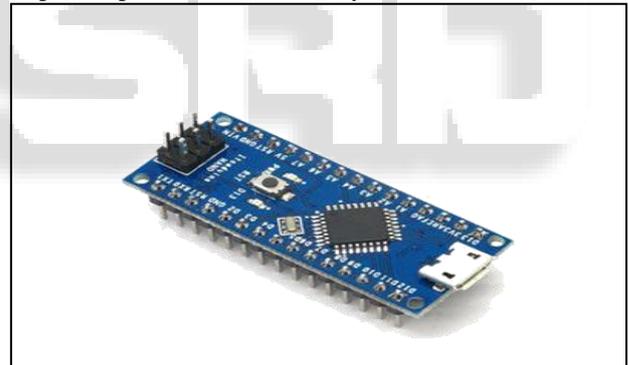


Fig. 3: Arduino Nano

C. Heartbeat sensor:

The pressure of the blood in the arteries as it pumped around the body by the heart is known as blood pressure. When your heart beats, then it will supply the blood through the arteries to all the parts of user body. This force creates pressure on the arteries. The systolic pressure (as the heart beats) over the diastolic pressure (as the heart relaxes between beats) is the 2 number of Blood pressure which as recorded. The unit which measures this is called Sphygmomanometer. If you have high blood pressure then it is important to do monitoring blood pressure at home and it is important for many peoples. At every time the blood pressure not be stay same. It changes to meet your body's needs. It is affected by various factors of the body like position, breathing or emotional state, exercise and sleep. When you are relaxed and sitting or lying down then it is the best time for measure blood pressure.



Fig. 4 Bluetooth Sensor

D. Bluetooth module:

The HC-05 Bluetooth Module and it can be Master or Slave configuration, making it a great solution for wireless communication. Simply it can be use for a serial port replacement to establish connection between MCU and GPS, PC to your embedded project, etc.

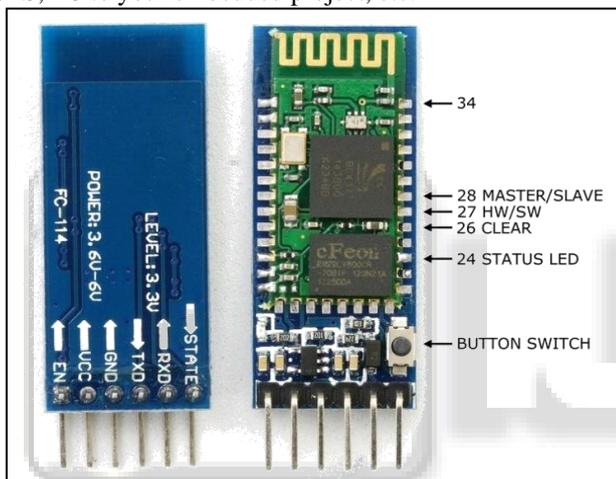


Fig. 5: HC-05 Bluetooth

The HC-05 Bluetooth Module have 6 pins are as follows: Vcc, GND, TX, RX, Key, and LED. The pre-programmed as a slave, so if you want to connect the Key pin then you need it change it to Master Mode. The difference between Master and Slave modes is that, in Slave mode the Bluetooth module cannot start a connection, in Master mode it can any how accept incoming connections. After the connection is starts the Bluetooth module can send and receive data indifferent of the mode it is running in. In the Slave mode, if you are using a phone to connect the Bluetooth module then easily it will used. The normally data transmission rate is 9600kbps. The range for Bluetooth communication is in between 30m.

1) Features

Protocol: Bluetooth Specification v2.0+EDR

Frequency: 2.4GHz ISM b-and

Modulation: GFSK

Speed: Asynchronous: 2.1Mbps (Max) / 160 kbps,

Synchronous: 1Mbps/1Mbps

Security: Authentication and encryption

Profiles: Bluetooth serial port

Power supply: +3.3VDC 50mA

V. CONCLUSION

A healthcare monitoring system using Raspberry pi and Arduino by means of using mobile device (Telegram) and sensors can be implemented in a global network with the help of Arduino and Raspberry Pi. The devices share information with Doctor through Telegram, making it possible to collect and monitor data more accurately. Our sensor can be used for monitoring the patient and providing the services in a proper time. The proposed system can be enhanced and extended by using other invasive as well as non-invasive sensors for picking up essential medical potentials of a patient. This can be further analyzed, stored and transferred on a global platform. This will help showing results parallelly so that ease of connection and time saving can be facilitated. The propose system give better and effective healthcare service to patients. The propose model is well equipped system where the doctor can check his patient anywhere, anytime. Emergency Message will sent through Telegram application to the Doctor, and the doctor will check that patient details (Systolic Pressure, Diastolic Pressure, and Pulse Rate) and give him proper medicines.

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