International Research Journal of Engineering and Technology (IRJET) e-ISSN: 2395-0056
Volume: 06 Issue: 03 | Mar 2019 www.irjet.net p-ISSN: 2395-0072

HEALTH MONITORING SYSTEM FOR HEART PATIENT

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Abstract - *A remote mobile health monitoring system with mobile phone and web service capabilities is proposed in this paper. It provides an end-to-end solution; specifically, (1) physiologic parameters, including heart beat rate and body temperature are measured by wearable sensors and recorded by a mobile phone which presents the graphical interface for the user to observe his/her health status more easily; (2) it provides doctors and family members with necessary data through a web interface and enables authorized personnel to monitor the patient's condition and to facilitate remote diagnosis; and (3) it supports real-time alarming and positioning services during an urgent situation, such as a tumble or a heart attack , so that unexpected events can be handled in a timely manner. Experimental results show that the proposed system can reliably monitor the physiologic parameters and conveniently report the user's position.*

Key Words: Arduino nano, heart beat sensor, temperature sensor, humidity and temperature sensor, movement sensor ADXL 337.

I. INTRODUCTION

From the survey of WHO we analysed that 1.1 billion of adults have raised high blood pressure and in the total global population only less than 1 in 5 have controlled blood pressure. Every year 17.9 million people die from cardiovascular diseases i.e. 31% of all global deaths are due to heart problems. As the demand of health care rises rapidly, ancient diagnosis methods had become insufficient. Especially for the heart patients it is necessary to be in continuous observation and it is not possible in this money making world. Appointing a personal caretaker for each patient from the hospital may requires more manpower and also it is difficult to. To avoid these issues it is better target in e-health monitoring (i.e.) Remote Mobile Health Monitoring (RMHM) system. Since it can help doctors to implement regular monitoring and remote diagnosis on time, RMHM will not only improve the patient's quality of life but also reduce the burden of the medical system and the cost of public health. In recent years, physiologic sensors and wireless communication have gained great progress. Various RMHM systems have been proposed, but there are still limitations and challenges in improving their application. The main drawback of traditional health monitoring system is that patients are "constrained" within smart rooms and beds fitted with wired monitoring devices. The main attractive application of wireless-sensor-network (WSN) based systems is the indoor localization of both devices and patients.

II. ARDUINO NANO

The arduino nano is a small software development board based on the ATmega328P (Arduino Nano 3.X)/Atmega168. It comes with exactly the same functionality as in Arduino UNO but quite in small size. It comes with an operating voltage of 5V, however, the input voltage can vary from 7 to 12V. Arduino Nano pinout contains 14 digital pins, 8 analog pins, 2 reset pins, 6 power pins. Each of these digital & analog pins is assigned with multiple functions but their main function is to be configured as input or output. Functions like pin mode () and digital write() are used to control the operations of digital pins while analog Read() is used to control analog pins. The analog pins come with a total resolution of 10 bits which measure the value from zero to 5V. Arduino board software is equally compatible with Windows, Linux or MAC.

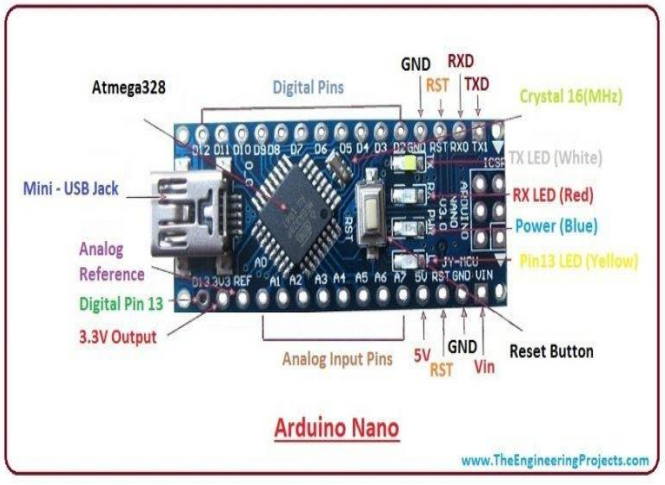


Fig.2.1ArduinoNano

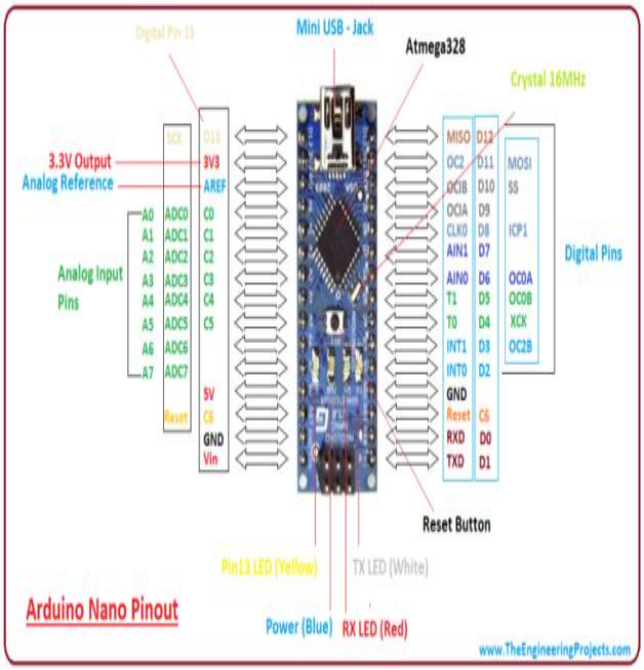


Fig.2.2 Arduino Nano pin configuration

III. EXISTING SYSTEM

Patient parameter monitoring system using raspberry pi is designed to be used in hospitals for measuring and monitoring various parameters like temperature, ECG , heart beat etc. The results can be recorded using raspberry pi displayed on the LCD display. Also the results can be sent to server using GSM module. Doctors can login to a website and view those results and any time they want.

DRAWBACK

- Module size is much larger to carry
- Cost of this existing system is high.

IV. LITERATURE SURVEY

IoT BASED HEART ATTACK DETECTION , HEART RATE AND TEMPERATURE MONITOR.-by Gowrishankar S., phD published on July 2017.

The Internet of Things (IoT) is inter communication of embedded devices using networking technologies. The IoT will be one of the important trends in future, can affect the networking, business and communication. In this paper, proposing a remote sensing parameter of the human body which consists of pulse and temperature. The parameters that are used for sensing and monitoring will send the data through wireless sensors. Adding a web based observing helps to keep track of the regular health status of a patient. The sensing data will be continuously collected in a database and will be used to inform patient to any unseen problems to undergo possibe diagnosis. Experimental results prove the proposed system is user friendly, reliable, economical.

V. PROPOSED WORK.

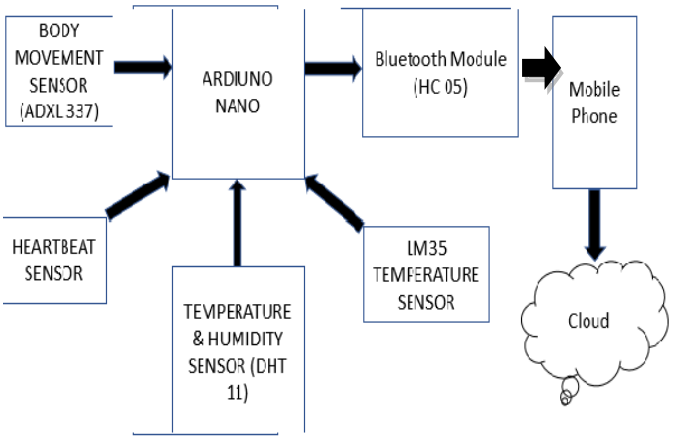
Our main objective is to design a cost effective and feature rich system. Our project uses mainly ARDUINO NANO to collect the data from the sensors which deals in monitoring the health condition of a patient. It also uses cloud facility for safer encryption of the data.

Our system comprises of ARDUINO NANO which is interfaced with sensors that is used in collecting the data from our body. Then the data is sent thorough Bluetooth module to the cloud database. Cloud database that we used here is firebase cloud database. GPS systems are extremely versatile and can be found in almost any industry sector. They can be used to map forests, help farmers harvest their fields, and navigate airplanes on the ground or in the air. GPS systems are used in military applications and by emergency crews to locate people in need of assistance. Assisted GPS or Augmented GPS is a system that often significantly improves the startup performance -i.e., time-to-first-fix of a GPS satellite-based positioning system.

ADVANTAGES

- Cost is less compared to device developed by using raspberry Pi.
- Low maintenance cost.
- Data can be stored for future reference.

VI. BLOCK DAIGRAM



1) Heart Beat Sensor

The Heart beat sensor is a plug and play heart beat/rate measuring sensor for arduino. It can be used by developers who want to easily incorporate live heart-rate data into their projects. Essence it is an integrated optical amplifying circuit sensor. The pulse sensor has been clipped on earlobe or finger tip and plugged it into arduino. Also have an arduino demo code that makes it easy to use. It's operating voltage is 5V and operating current is 4mA.

Fig.4.1. Heartbeat sensor

2) Temperature sensor

LM35 is a semiconductor based integrated analog temperature sensor whose electrical output is proportional to Degree Centigrade. It does not external calibration or trimming to provide typical accuracies. LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. Main advantage of LM35 is that it is linear i.e. 10mv/°C which means for every degree rise in temperature the output of LM35 IS 220mv/0.22V the temperature will be 22°C. So if room temperature is 32°C then the output of LM35 will be 320mv i.e. 0.32V

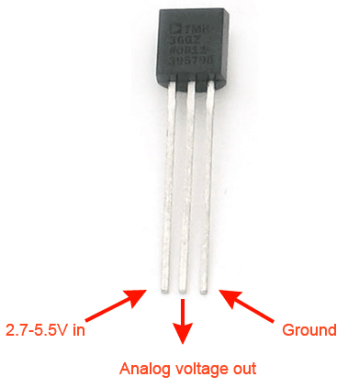


Fig.4.2. Temperature sensor LM35

3) Humidity and temperature sensor

DHT11 Temperature and humidity sensor features a calibrated digital signal output with temperature and humidity sensor capability. It is integrated with a high performance 8 bit microcontroller. It includes a resistive element and a sensor for wet NTC temperature measuring devices. DHT11 comes with supply voltage of +5V and it can measure the humidity range from 20%-90% RH with error of ±5% RH. Features like small size, low power, signal transmission up to 20 meters, enabling variety of applications and the most demanding one

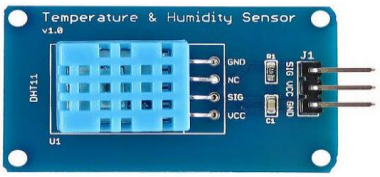


Fig.4.3.DHT temperature sensor

4) Movement sensor ADXL 337

ADXL337 is a small, thin, low power, complete 3-axis accelerometer with signal conditional analog voltage outputs that measure acceleration with range of ±3g. It is not difficult to get breakout set-up of ADXL337. It should be noted that this breakout has a maximum voltage 0f 3.6V. Fortunately, it doesn't need a lot of power to make the accelerometers to work. In normal operating mode they typically draw about 300 μA.

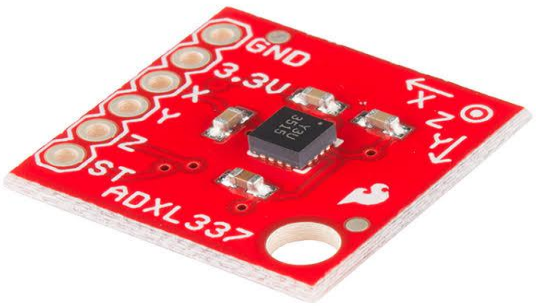


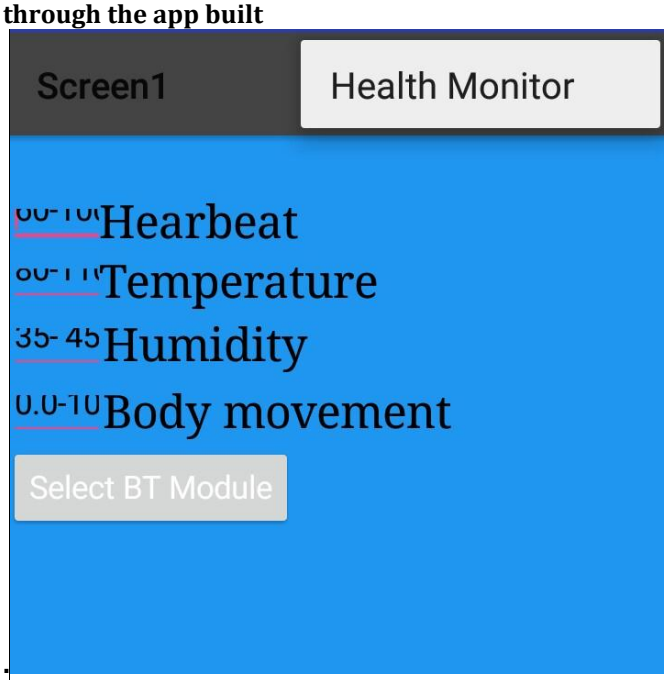
Fig.4.4. Movement sensor ADXL 337

3. CONCLUSIONS

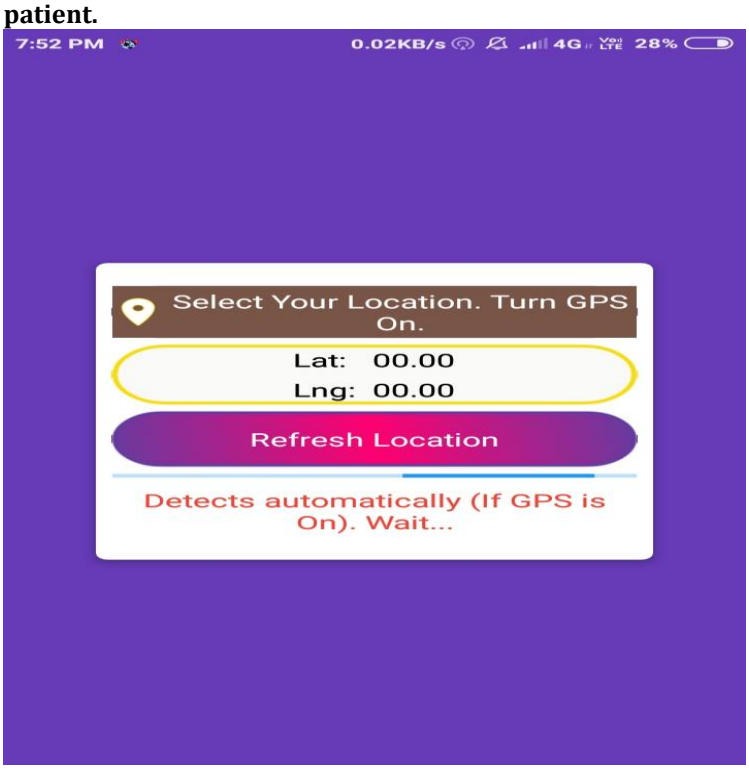
In this paper, we have proposed a new Remote Mobile Health Monitoring System that can provide pervasive and continuous health-monitoring of patients. Based on the mobile phone and web service, we designed a multilayer architecture. For each layer, we identified and investigated certain operation and function implementation. To meet the requirement of emergency situations, a Bluetooth based localization method was proposed for indoor environment. Experimental results showed the stable performance of the proposed RHMS.

4. RESULT

1. App working to measure the physiologic parameters and displays to the caretaker's device through the app built



2. GPS app working to track the location of the patient.



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