ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

Heart Health Monitoring And Location Tracking System

CH.Sunil Naidu[1], K.Pavan Kumar[2], R.Srikanth[3], D.Suvarna Raju[4],**Vivek Viswanadh**

Electrical and Electronics Department, Vignan's Institute of Information Technology, Vizag, India

Email:postbox73187@gmail.com,pavankumar02314@gmail.com,srikanthreddy98487@gmail.com,suvarnaraj8009@gmail.com,vivekviswanadh@gmail.com.

Abstract

Health-related characteristics and issues are extremely important to man's life and influence. Various technologies that can capture and monitor changes in health markers have been created. This paper describes a real-time remote heart rate monitoring system. This device uses a heart rate monitor with an alert and LCD display. This work uses a wireless module to construct a low-cost, efficient, and flexible heart rate detection and alarm system. The heart rate is sensed and measured by the sensors, and the signals are transferred to the control unit for processing. The heart rate is displayed on the LCD by the processor, which is subsequently passed on to the warning system. If the disparity between the normal and the abnormal is significant

INDEX TERMS: Arduino, Temperature and Humid sensor, HeartBeat Sensor, Power Modulator, GSM Module, Communication,LCD Display,Buzzer.

1.Introduction

Cardiovascular Diseases caused 1.7 million fatalities (17.8%) in 2016, according to the Global Burden of Disease Report, and are the top cause of death in India [1]. The Indian Heart Association estimates that 25% of all heart attacks occur in people under the age of 40 In most cases ,Initial heart attacks are frequently overlooked. Even after a diagnosis, according to government data [2,] 50% of heart attack cases reach the hospital in less than 24 hours more than 400 minutes, as opposed to the optimum 180 minutes; after which the injury is permanent. The delay is sometimes attributed to the time it takes to establish an agreement.

Indians are increasingly susceptible to Cardiovascular Diseases as a result of their changing lifestyle. CVDs are a silent killer because they are usually connected with older people. Recent studies have revealed that about a quarter of heart attacks occur in people under the age of 40. The stress aggravates the condition even more.Diabetes is linked to a sedentary

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

lifestyle. As a result, it's critical to keep track of your health on a daily basis and, if necessary, seek medical treatment for it. The suggested method employs wired human sensors to monitor heart rate via a wearable device and transfer the information to the cloud. The IoT device, which is enabled by sensors and the internet, will aid in the cloud analysis of the system; the analysis will be carried out with different age groups with different cardiac conditions in mind.Since the heart rate changes according to age, it might be either high or low.

The heart rate varies with age, physical activity, air temperature, stress, and other factors; the system employs calibrations to figure out what's causing the variation dependent on pulses transmitted to the stator windings, they do not have a horsepower rating. The frequency of the pulses is used to control the motor's speed. Hard disc drives, robots, antennas, telescopes, and some toys all employ stepper motors for accurate positioning using a motor.

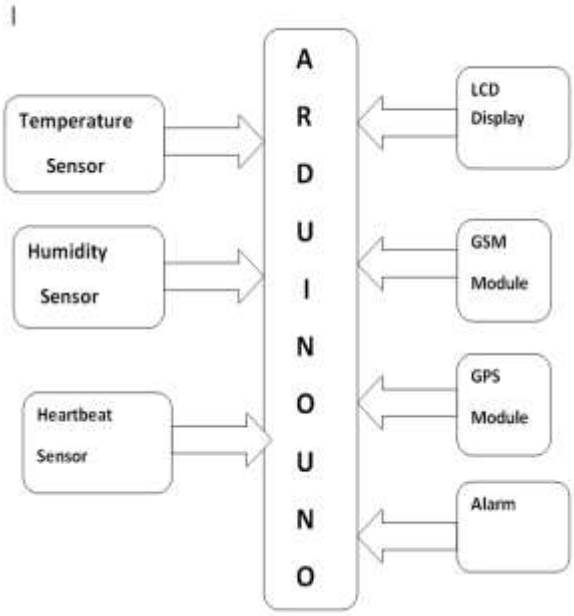
TRADITIONAL APPROACH VS PROPOSED SYSTEM:

The patient or caretaker must traditionally notify the hospital or ambulance before treatment can commence.

According to civil registration data from 2013, 27 percent of total deaths in India occur without medical intervention.

As a result, the suggested system aims to avoid heart attacks and cardiac arrest by offering a comprehensive solution. A wrist-worn sensor records data as well as heartbeat in real time as part of the system.The data is then examined using algorithms in the cloud. In the event of a heart attack, the system sends an alarm to the nearest hospital, ambulance, and the patient's emergency contacts. In addition, the system assists the ambulance in the same way that the Ola app does, directing it through the quickest path.

BLOCK DIAGRAM:



Sensors:

The Sensors captures Beats per minute (BPM), air temperature and barometric pressure. In addition to the above data, the system also considers age, maximum and minimum heart rate while analyzing the data in the cloud. Based on the evaluation, an alert is triggered. The system is simple and user-friendly to save the life from a cardiac attack/heart attack.

Modules:

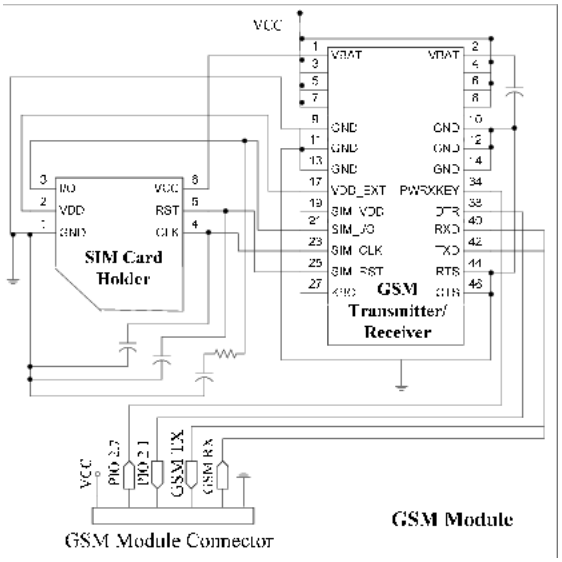
ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

The main module, the Sensing Module, collects data from several sensors linked to the Arduino Pro Mini. A temperature sensor and a pulse sensor are included in the module.

b. Alert Module: The alert module will transmit notifications to natives, ambulances, and hospitals.The treatment can be completed in as little as 180 minutes. Not only will this warning system send the message but also send the mail, and the ambulance will have all of the patient's information location.

2.GSM Module:

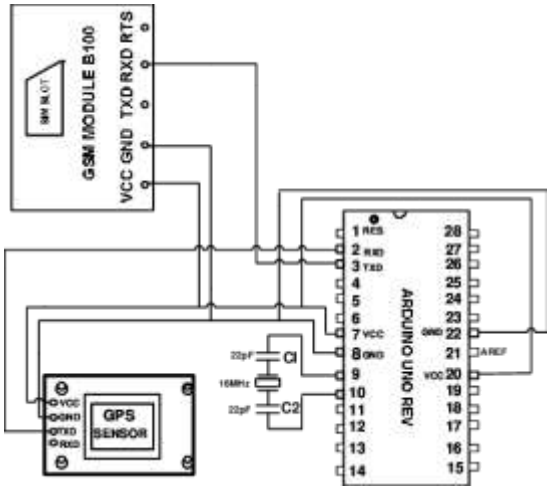
The most widely used wireless cellular communication technique for public communication is GSM, or Global System for Mobile Communications. The GSM standard was created to define protocols for digital cellular networks of the second generation (2G).It began as a circuit switching network, but after incorporating General Packet Radio Service (GPRS) technology, packet switching was deployed. The GSM frequency bands 900 MHz and 1800 MHz are the most extensively used.



GPS Module:

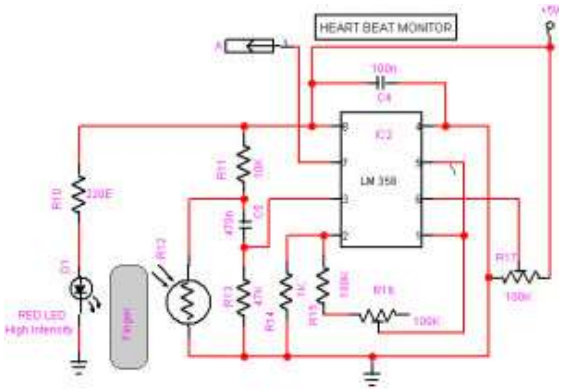
The GPS is a satellite-based navigation system that delivers location and timing information. Anyone with a GPS receiver and an unobstructed line of sight to at least four GPS satellites can use the system for free. The position of a GPS receiver is calculated by accurately timing the signals sent by GPS satellites. GPS is increasingly widely utilised, and smart phones include it as standard equipment.The GTPA010 module is simple to operate, with an RS232 and USB interface. It operates on a 3.2 to 5V supply range, allowing it to interface with both 3.3V and 5V microcontrollers. The GPS data is output in NMEA0183 format. Each message string begins with the letter '$,' followed by the message identification. Each parameter is unique.

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

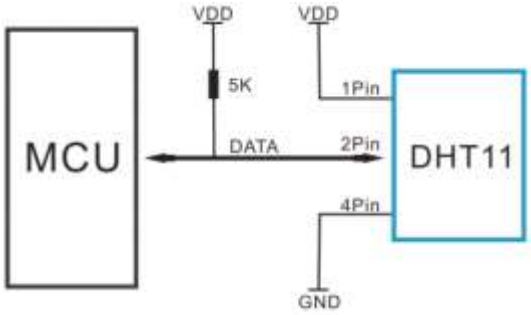


HeartBeat Sensor:

A light-emitting diode and a detector, such as a light-detecting resistor or a photodiode, make up the basic heartbeat sensor. The flow of blood to different parts of the body is affected by the heartbeat pulses. When tissue is lit by a light source, such as the light emitted by a led, it either reflects (as in finger tissue) or transmits the light (earlobe). The blood absorbs some of the light, and the light detector receives the transmitted or reflected light. The amount of light absorbed is determined by the tissue's blood volume. The detector produces an electrical signal that is proportional to the rate of heartbeat.This is a DC signal that pertains to the tissues.



Temperature and Humid Sensor:



A capacitive humidity detecting element and a thermistor for temperature detection make up the DHT11 sensor. A moisture-holding substrate serves as a dielectric between the two electrodes of the humidity sensor capacitor. Change in the capacitance value occurs with the change in humidity levels. The IC measures, processes, and converts the resistance values into digital form.

Arduino Uno:

The ATmega328P microprocessor is used in the Arduino/Genuino Uno microcontroller board (datasheet). A 16 MHz quartz crystal, 14 digital input/output pins (six of which can be used as PWM outputs), six analogue inputs, a USB connection, a power jack, an ICSP header, and a reset button are all found on the board. It comes with everything you'll need to get started with the microcontroller; simply plug it into a computer with a USB cable or power it with an AC-to-DC adapter or battery. The ATmega328P microprocessor is used in the Arduino/Genuino Uno microcontroller board (datasheet). A 16 MHz quartz

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

crystal, 14 digital input/output pins (six of which can be used as PWM outputs), six analogue inputs, a USB connection, a power jack, an ICSP header, and a reset button are all found on the board. You can tamper with your UNO without fear of making a mistake; if something goes wrong, you can replace the chip for a few dollars and start over. "Uno" means one in Italian and was chosen to mark the release of Arduino Software (IDE) 1.0. The Uno board and Arduino Software (IDE) version 1.0 were the reference versions of Arduino, which have since been superseded by newer releases. The Arduino Uno board is the first of a series of USB Arduino boards and the platform's reference model; see the Arduino index of boards for a comprehensive list of current, historical, and obsolete boards.

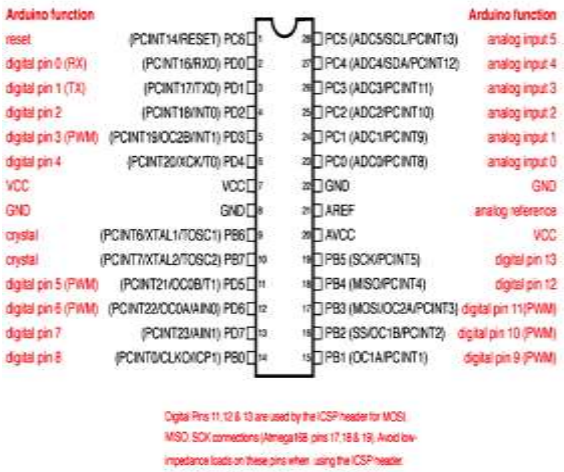


Fig-1: **Arduino Uno to ATmega328 Pin Mapping**

RF-Receiver module

LCD Display:

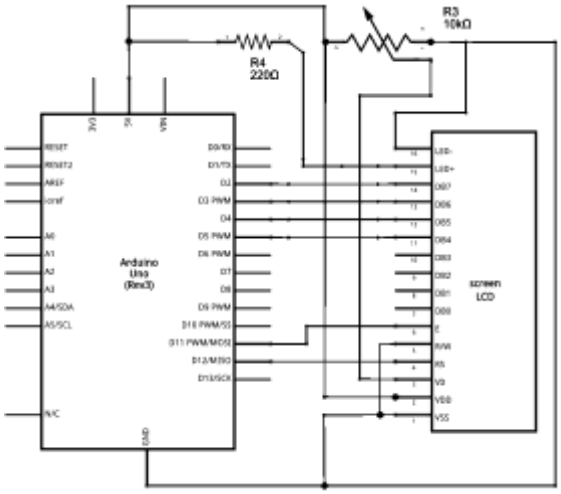
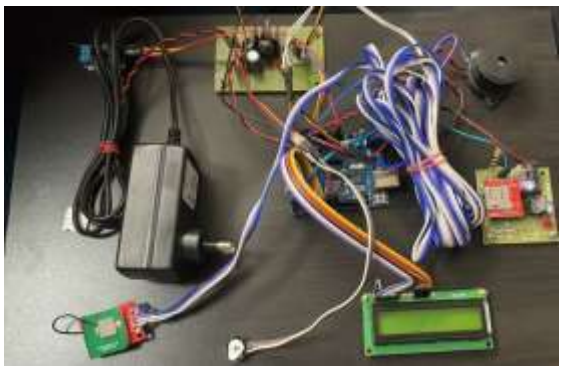


Fig-2: Pin diagram of LCD display with arduino.

3.Model and Function



As shown in the above figure,the circuit diagram is as shown in above process, Such that the sensing operations was been done from the DTH11 and Heartbeat Sensor as shown in the above path.The readings are been noted within the code provided and

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

hence the input was been taken within the i/p module.

Coding Section:

```
#include<LiquidCrystal.h>
LiquidCrystal lcd(2, 3, 4, 5, 6, 7);
#include <SoftwareSerial.h>
SoftwareSerial gps(8, 9); // RX, TX
int i=0;
#include<dht.h>
#define dht_dpin A0

dht DHT;
int temperature, humidity;

int  gps_status=0;
float latitude=0;
float logitude=0;
String gpsString="";
char *test="$GPRMC";
int hb;
int hbpin = 10;

 int hbeat=0;
 unsigned long int duration = 0;
int upload=0,count=0;
unsigned int TEMP;
int val;
float TEMP1;
//////////////////////////////////////////////////////////
//////
int BUZZ = 15; //Connect LED 2 To Pin #7 //////buzzer
//////////////////////////////////////////////////////
//unsigned int MEMSX;
//unsigned int MEMSY;
//////////////////////////////////////////////////////////
//////////////////////////////////////////////////////////
/
void initModule(String cmd, char *res, int t)
{
while(1)
{
Serial.println(cmd);
delay(100);
while(Serial.available()>0)
{
if(Serial.find(res))
{
Serial.println(res);
delay(t);
return;
}
else
{
Serial.println("Error");
```

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

}

The above was the brief sample of code used for all the instruction purpose within the arduino uno.And hence these set of instructions are been stored in a form of a programming language,which can be dumped in the arduino uno.The above code has all the functionality related instructions in a précised form.

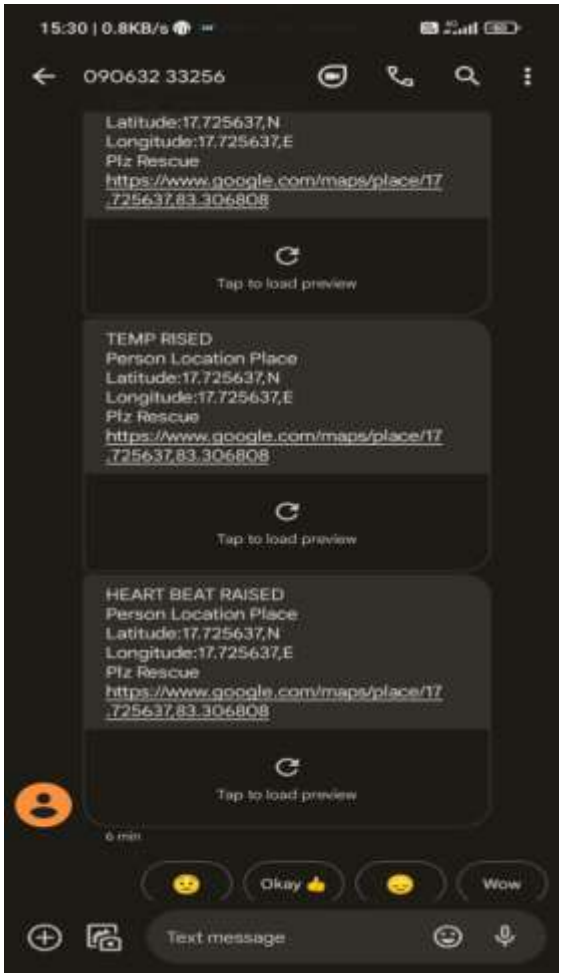


Fig-4: Output section

The data sent by the input section is received by the output section. Arduino, LCD, mobile sms and through buzzer the alarming, was done are included in the output.

The data that is received will be processed by Arduino. i.e., microcontroller.

The data will be processed by the microcontroller, and all of the other components that will operate the motor will be linked to the controller.

The data was been furtherly processed in the arduino as the code was provided.Whereas when the parameters of the heartbeat and humidity etc are been able to crossing the noted values.

The buzzer was furtherly ranged, and the data regarding the person's heart beat or temperature or humidity was been sent to the monitoring mobile through the use of the gsm and the gps modules.So that the person can be easily able to track the heart conditioning of the patient.

That's how the equipment will work according to data given by user.

4.Result

From this project, the following conclusions may be drawn. Though the suggested method has not yet been implemented, preliminary results demonstrate that if therapy is supplied on time, a patient's life can be spared. The technology is being tested with a small group of people; it is getting accurate values from the patient's body and triggering an alert if there is an emergency . The framework aims to reduce cardiac arrest-related mortality, particularly while the patient is unconscious. Unconsciousness or slumber Furthermore, the proposed framework will aid in improving the accessibility of information.In the city, there's an ambulance. The proposed method is user-friendly and cost-

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

effective, so CVD patients can benefit.cost and maintain careful checks on them, so that in the event of an emergency, help might arrive quickly.

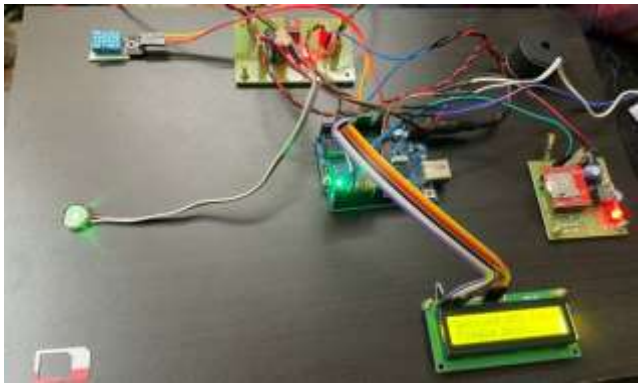


Fig 5: Final view of the project.

5.Conclusion

The proposed system is though not yet implemented however preliminary results shows that life of a patient can be saved if the treatment is provided on time. The system is tested with a limited number of people; the system is taking correct values from the patient body and triggering the alert if any emergency is sensed. The framework aims to reduce cardiac arrest-related mortality, particularly when the patient is sleeping or unconscious so, in case of emergency help could reach them through the fastest route.

Acknowledgement

- This paper is a part of B. Tech Final year major project. The completion of this undertaking could not have been possible without the assistance of our college – Vignan's institute of information technology, Duvvada, Vishakapatnam, Andhra Pradesh, 530047, India. Their contributions and guidance are gratefully acknowledged. Their support and contribution ensured the completion of the project. We are highly indebted to our Principal, our Training and Placement Dean and our training and placement cell, who have granted us with necessary data and made it possible for us to work on it. We express our gratitude to our project review panel for gracing us with their advice. We are highly grateful to our guideMr.VIVEKVISWANADH, who has put us in the right path and have guided us through the project from the start till the end with her abundant experience and has ensured to the completion of the paper.

REFERENCES

- IoT based heart monitoring and alerting system with cloud computing and managing the traffic for an ambulance in India Khushboo Bhagchandani1 , D. Peter Augustine2 1Department of Computer Science, CHRIST (Deemed to be University), India 2Faculty of Computer Science, CHRIST (Deemed to be University), India
- Developing IoT Based Smart Health Monitoring Systems: A Review Ashikur Rahaman, Md. Milon Islam* , Md. Rashedul Islam, Muhammad Sheikh Sadi, Sheikh Nooruddin Department of Computer Science and Engineering, Khulna University

ISSN: 2278-4632
Vol-12 Issue-01 No.01: 2022

of Engineering & Technology, Khulna 9203, Bangladesh

- An Efficient IoT-Based Patient Monitoring and Heart Disease Prediction System Using Deep Learning Modified Neural Network SIMANTA SHEKHAR SARMAH , (Member, IEEE) Alpha Clinical Systems Inc., Piscataway, NJ 0885
- The IoT-based heart disease monitoring system for pervasive healthcare service Chao Lia, *, Xiangpei Hua , Lili Zhangb a Institute of Systems Engineering, Dalian University of Technology, Dalia 116023, China b School of Business,Dalian University of Technology,Panjin Campus, Panjin 124221, China
- IoT Based Heart Activity Monitoring Using Inductive Sensors Adrian Brezulianu 1 , Oana Geman 2 , Marius Dan Zbancioc 1 , Marius Hagan 1 , Cristian Aghion 1 , D. Jude Hemanth 3 and Le Hoang Son 4,