HEALTHCARE BOT:
HEART ATTACK RECOGNITION SYSTEM

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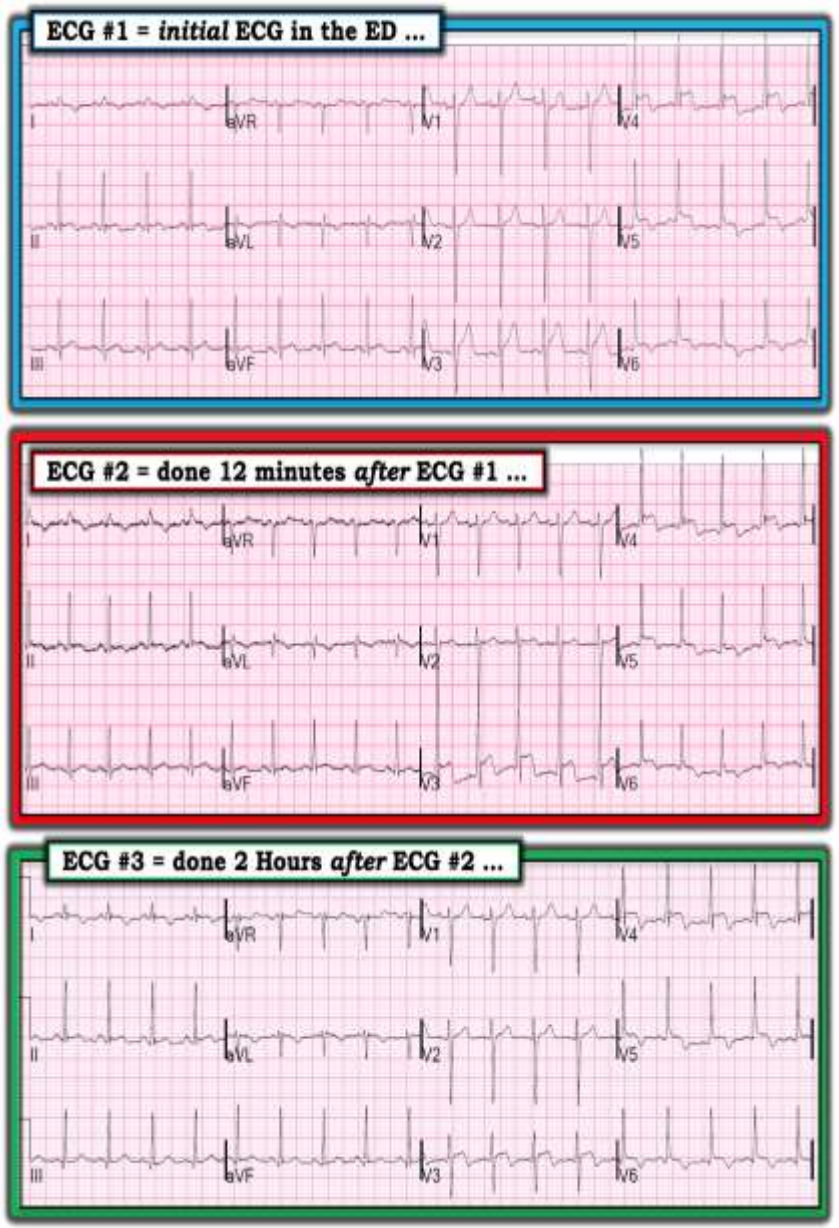

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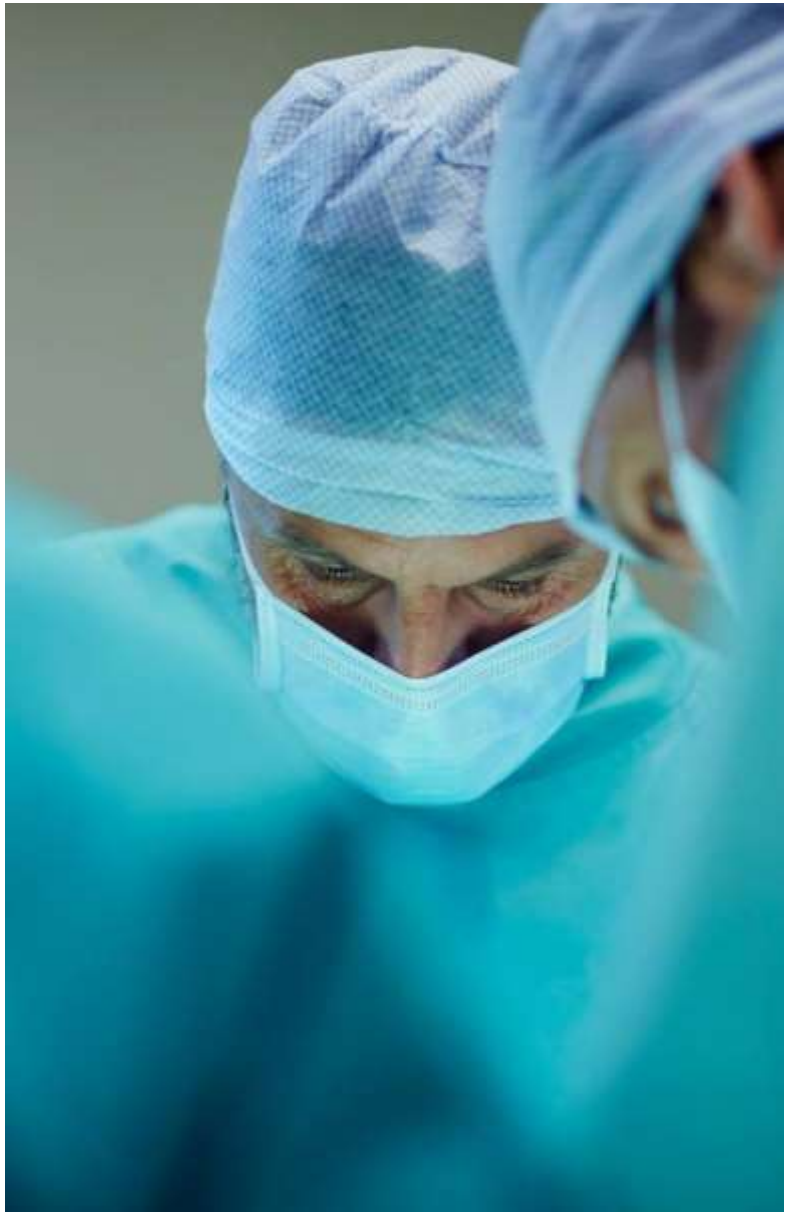


PROBLEM STATEMENT

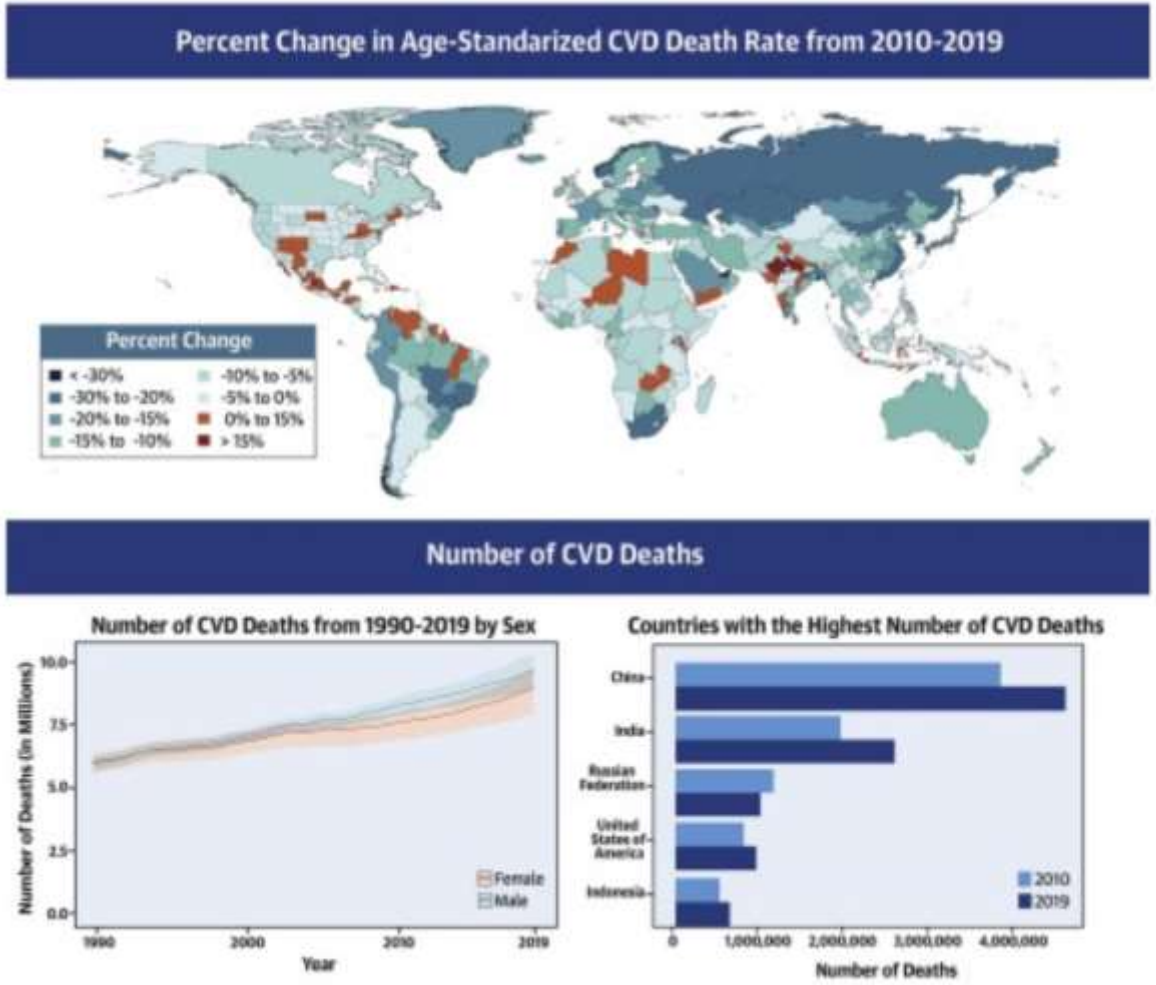
Nowadays numerous persons are mislaying their life owing to heart attack and shortage of medical attention to patient at correct stage. This attack cannot be predicted, but it can be known from the human heartbeat which is a very vital health parameter of the human cardiovascular system.

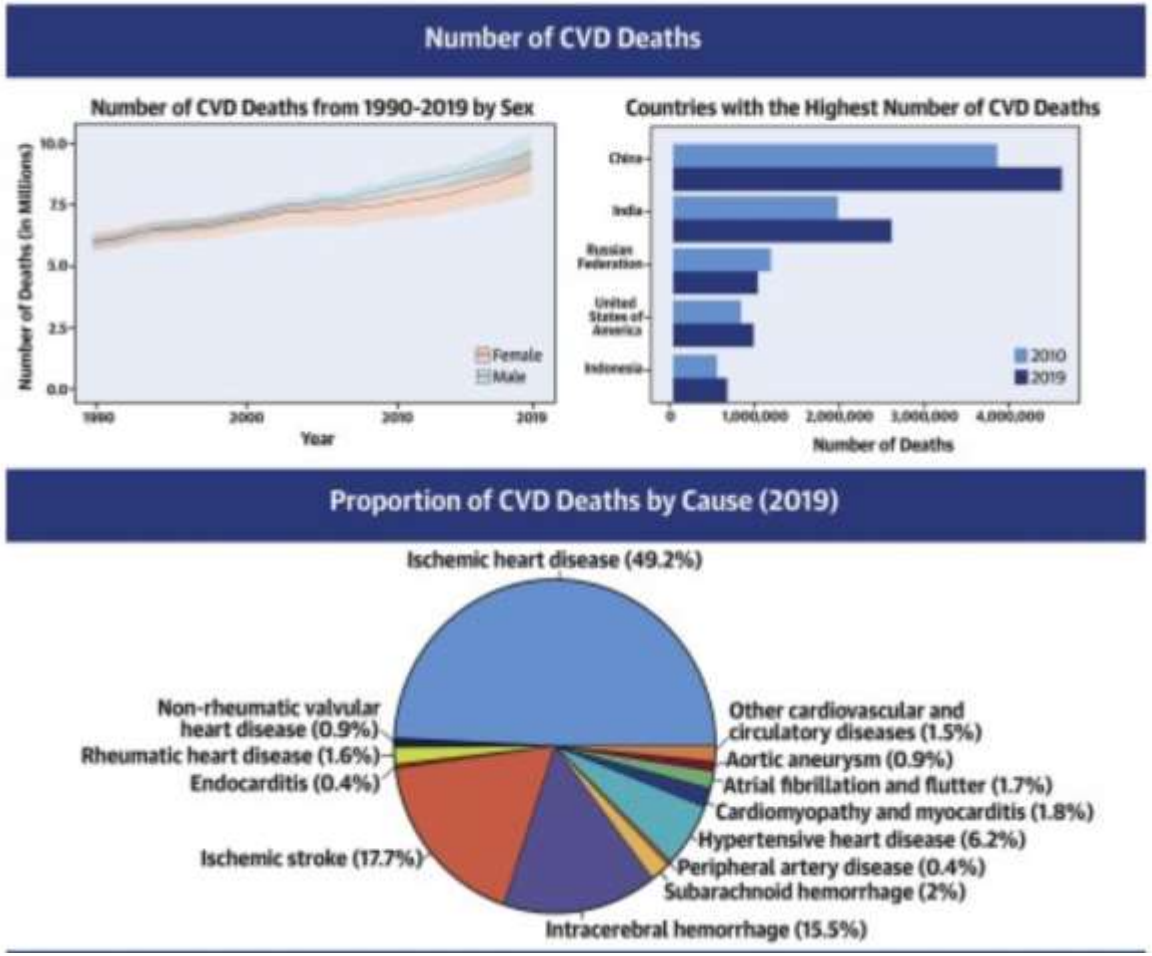
Heart rate reflects the health conditions of the human cardiovascular system that determined by such as stress at work, before or after sports and the psychology factor. Unfortunately, some people do not know their heart rate before or after doing an activity.

SURVEY:

- Prevalent cases of total CVD nearly doubled from 271 million (95% uncertainty interval [UI]: 257 to 285 million) in 1990 to 523 million (95% UI: 497 to 550 million) in 2019, and the number of CVD deaths steadily increased from 12.1 million (95% UI:11.4 to 12.6 million) in 1990, reaching 18.6 million (95% UI: 17.1 to 19.7 million) in 2019.
- The global trends for disability-adjusted life years (DALYs) and years of life lost also increased significantly, and years lived with disability doubled from 17.7 million (95% UI: 12.9 to 22.5 million) to 34.4 million (95% UI:24.9 to 43.6 million) over that period.
- The total number of DALYs due to IHD has risen steadily since 1990, reaching 182 million (95% UI: 170 to 194 million) DALYs, 9.14 million (95% UI: 8.40 to 9.74 million) deaths in the year 2019, and 197 million (95% UI: 178 to 220 million) prevalent cases of IHD in 2019.
- The total number of DALYs due to stroke has risen steadily since 1990, reaching 143 million (95% UI: 133 to 153 million) DALYs, 6.55 million (95% UI: 6.00 to 7.02 million) deaths in the year 2019, and 101 million (95% UI: 93.2 to 111 million) prevalent cases of stroke in 2019.

CENTRAL ILLUSTRATION





ABSTRACT

In this project we are implementing heart rate monitoring and heart attack recognition system using IoT. The system will carry hardware having sensors with android application. The heartbeat sensor will allow checking heart beat readings and store the data in the database which can be accessed by the health workers and the users using cloud technology. The developer may set the high and low level of heartbeat limits and the normal temperature range.

If the readings of both the sensor go higher than the specified range or below the specified range, the patient is more likely to get a heart attack.

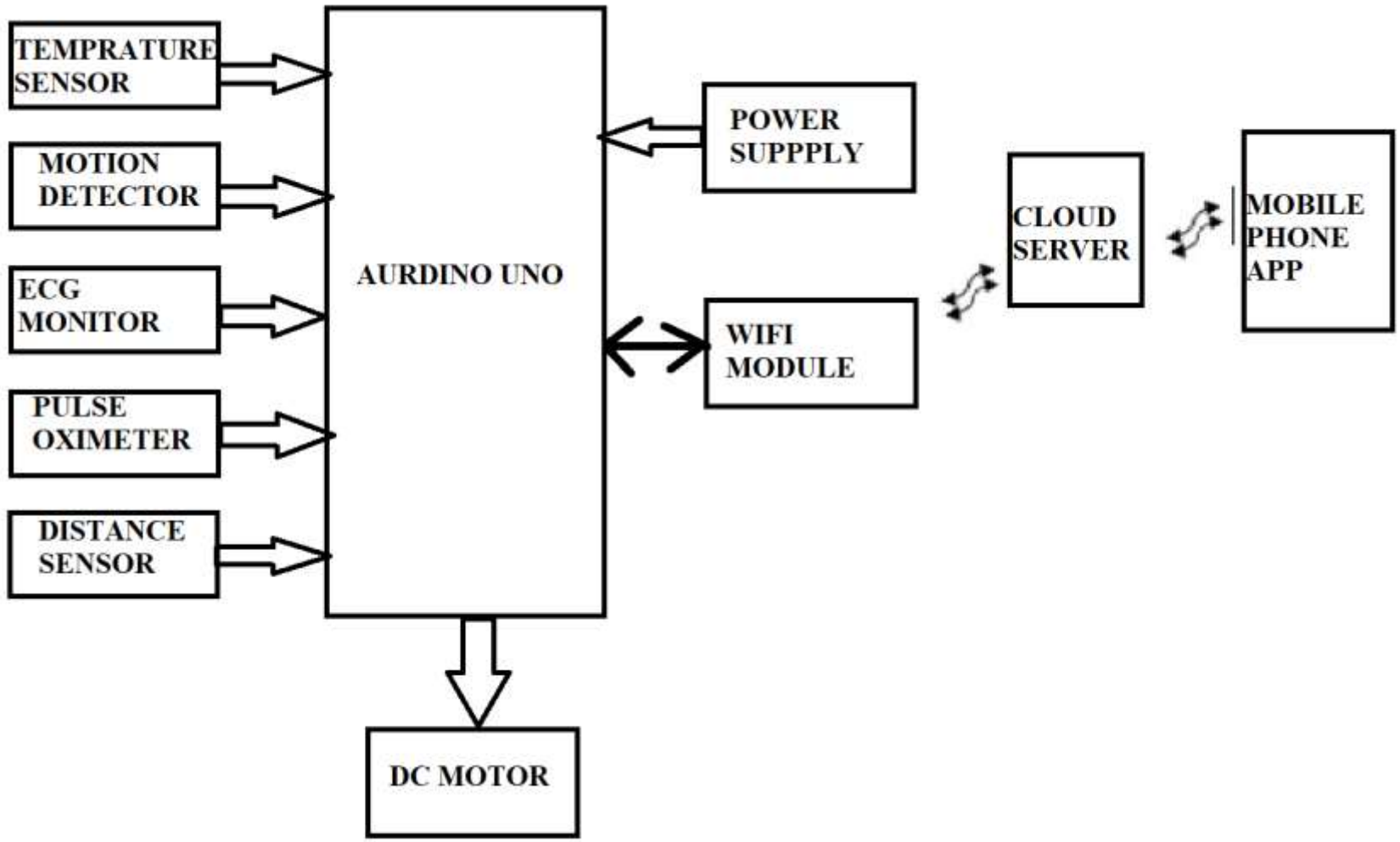
We also measure the heart rate by using the ECG or EKG (electrocardiogram) waveform as the comparison result of the pulse sensor (pulse oximeter) with ECG waveform. The sensor consists of an infrared light-emitting-diode (LED) and a photodiode. The LED transmits an infrared light into the fingertip which is reflected back from the blood inside of finger arteries.

AUTOMATED PILL DISPENSER

The system also provides a pill dispenser machine which dispenses medicines according to our needs which is intact to the robot. It can also be controlled using a android application and sensors with microcontroller programming which makes it more automated and compact.

METHODOLOGY

- The proposed system has ability of detecting and monitoring heart attack with help of heart rate readings of sensors based on internet of things and cloud computing. This method uses a **pulse sensor, ECG sensor, Arduino board, Bluetooth module and a Wi-Fi module.**
- There are four main ways to measure heart rate: electrocardiogram, photoelectric pulse wave, blood pressure measurement, and phonocardiography. Out of which the system uses the former two;
- After setting up the system, the pulse sensor will start sensing heart rate readings and will display the heartbeat of person on android application . Also, with the use of **Wi-Fi module it will transmit** the data over internet and the **Bluetooth module** enable to connect smart devices for easy transfer of incoming data.
- This system allows a set point which can help in determining whether a person is healthy or not by checking his/her heartbeat and comparing it with set point. After setting these limits, the system will start monitoring the heart rate of patient and immediately the heart rate goes above or below the certain limit the system will send an alert message.
- As a part of this project, we are implementing an android application model that will track the heartbeat of particular patient and monitor it correctly and give the emergency message on chances of heart attack.
- The bot which is a heath-care one is **line follower robot** which is controlled using android application using embedded programming and control. Each sensors are allotted separate I/O ports which are both digital and analog according to the needs. The Arduino UNO board used here, consists of ATmega328 chip which enables the developers to easily interface all the sensors using embedded C language.


TEMPRATURE SENSOR
MOTION DETECTOR
ECG MONITOR
PULSE OXIMETER
DISTANCE SENSOR
AURDINO UNO
POWER SUPPPLY
WIFI MODULE
CLOUD SERVER
MOBILE PHONE APP
DC MOTOR

VARIOUS COMPONENTS USED IN THE ROBOT

1. ARDUINO UNO BOARD

- Arduino UNO is based on an ATmega328P microcontroller
- It is easy to use compared to other boards, such as the Arduino Mega board, etc. The board consists of digital and analog Input/Output pins (I/O), shields, and other circuits and has a dedicated IDE to which it is programmed on.
- The Arduino UNO includes:

1) 6 analog pin inputs,
2) 14 digital pins,
3) a USB connector,
4) a power jack,
5) and an ICSP (In-Circuit Serial Programming) header.

2. ECG SENSOR

- The electrocardiography or ECG is a technique which collects electrical signals which are generated from the human heart.
- When an physiological arousal experiences then the ECG sensor allows us to recognize the level.
- AD8232 sensor is used to calculate the electrical activity of the heart.
- Electrocardiography can be used to help in diagnosing different conditions of the heart

3. IR TEMPERATURE SENSOR

- The MLX90614 is a Contactless Infrared (IR) Digital Temperature Sensor that can be used to measure the temperature of a particular object ranging from -70° C to 382.2°C. It is used as thermometer for non-contact temperature measurements.
- .The sensor uses IR rays to measure the temperature of the object without any physical contact and communicates to the microcontroller using the I2C protocol.
- . Due to its high accuracy and precision, it is also used in a wide range of commercial, health care, and household applications like room temperature monitoring, body temperature measurement, etc.

4. PULSE SENSOR

The Pulse Sensor is a plug-and-play heart-rate sensor for Arduino. It can be used by students, artists, athletes, makers, and game & mobile developers who want to easily incorporate live heart-rate data into their projects. The essence is an integrated optical amplifying circuit and noise eliminating circuit sensor. Clip the Pulse Sensor to your earlobe or fingertip. Then it into your Arduino, you are now ready to read heart rate. The pulse sensor has three pins: VCC, GND & Analog Pin.

5. Other peripherals

- HC-05 Bluetooth module
- ESP-8266 WI- Fi Module
- L298-N Motor driver modules
- Motors
- PIR sensor
- Jumper wires, bread-boards

These components are used to avoid obstacles in robot's pathway and thereby helping in robot's motion.

INITIAL STAGE

- Developing the idea and approval from the concerned faculty
- Planning the strategy and procuring the required components
- Deciding the total budget and presenting it for first review

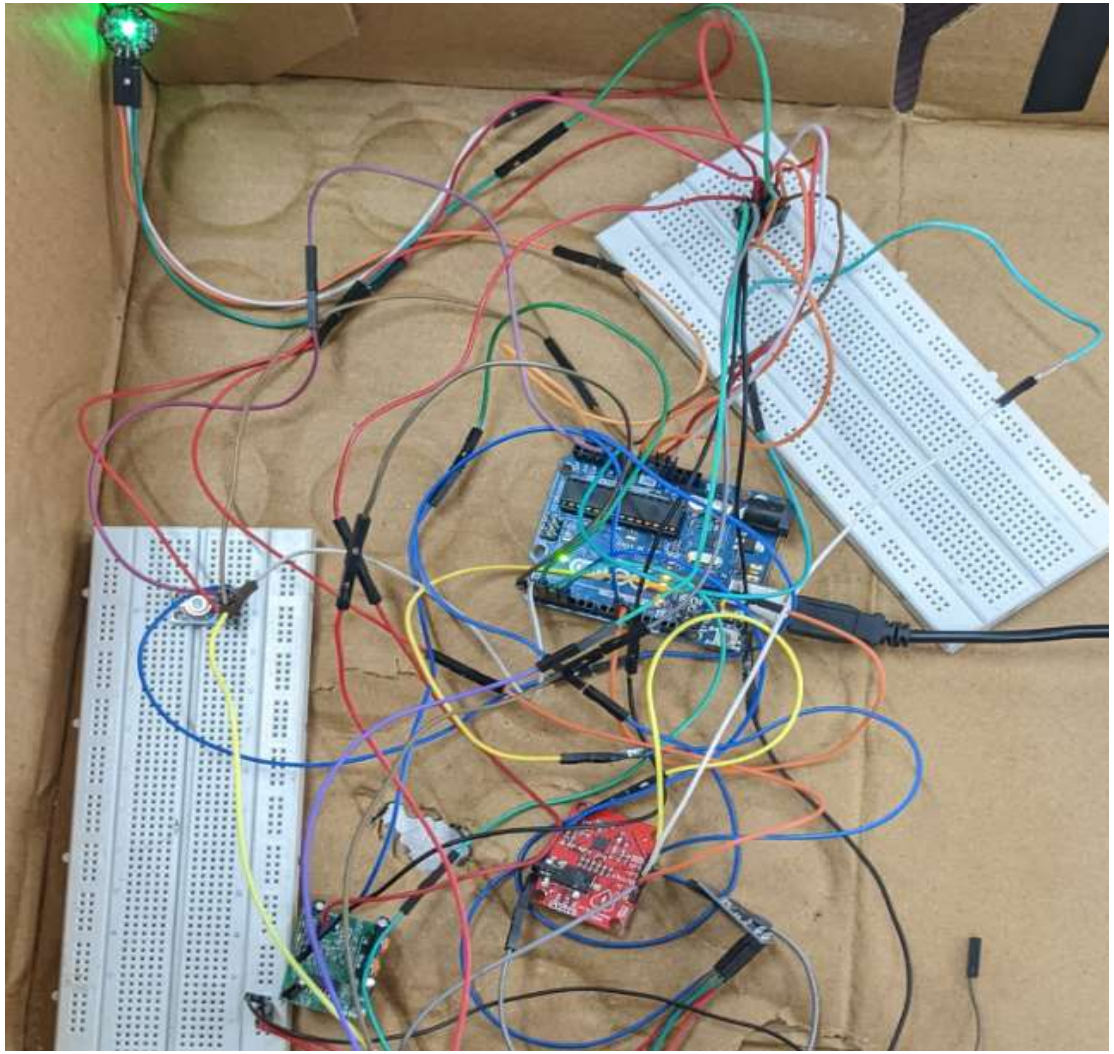
REVIEW- I

TIMELINE OF PROGRESS

- Completed the base circuit of the robot and sImulated the entire circuit using the Arduino IDE and interfacing all the sensors to the Arduino uno board
- Decided the dimensions of the robotic structure and completed the initial stage of the Mobile app
- Also completed the circuit of the line follower robot

REVIEW- II

WORKING CIRCUIT OF THE ROBOT



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THANK YOU