# TUF | THE UNIVERSITY OF FAISALABAD

# IoT ECG Monitoring with ECG Sensor

## INTRODUCTION

Public healthcare has been paid an increasing attention given the exponential growth human population and medical expenses. It is well known that an effective health monitoring system can detect abnormalities of health conditions in time and make diagnoses according to the gleaned data. As a vital approach to diagnose heart diseases, ECG monitoring is widely studied and applied.

In this project, we propose a new method for ECG monitoring based on Internet-of- Things (IoT) techniques.

## PROBLEM STATEMENT

With a rapid growth in human population and medical expenditure, healthcare has become one of most significant issues for both individuals and governments. Meanwhile, according to a report from the World Health Organization (WHO) , the problem of population aging is becoming more serious.

Due to the dominance in the diagnosis of heart-related diseases, electrocardiogram (ECG) monitoring has been widely applied in both hospitals and medical research. Traditionally, the ECG is detected through large and stationary equipment in professional medical institutions. in this project to address the challenges associated with health care domain of IoT.

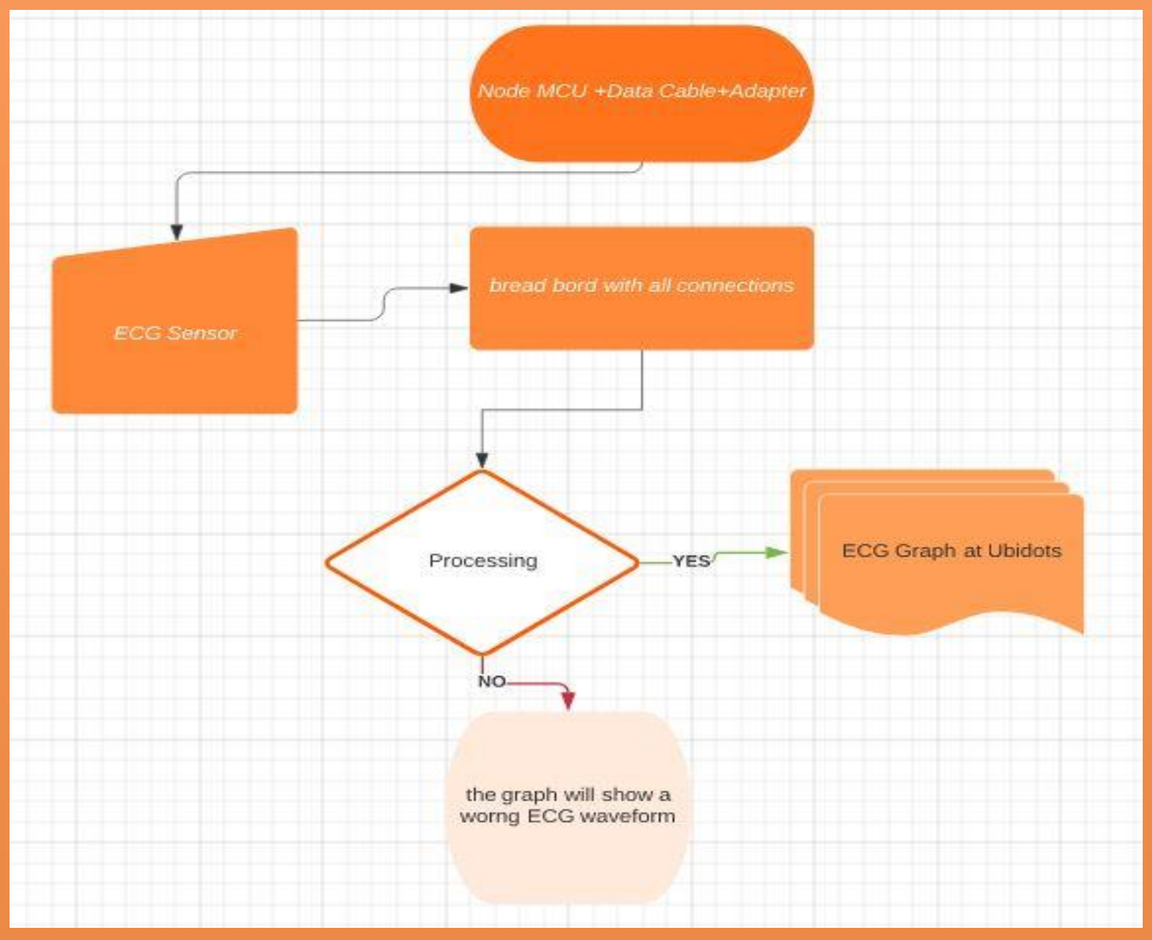
## OBJECTIVES

The objectives of this project are as follows:

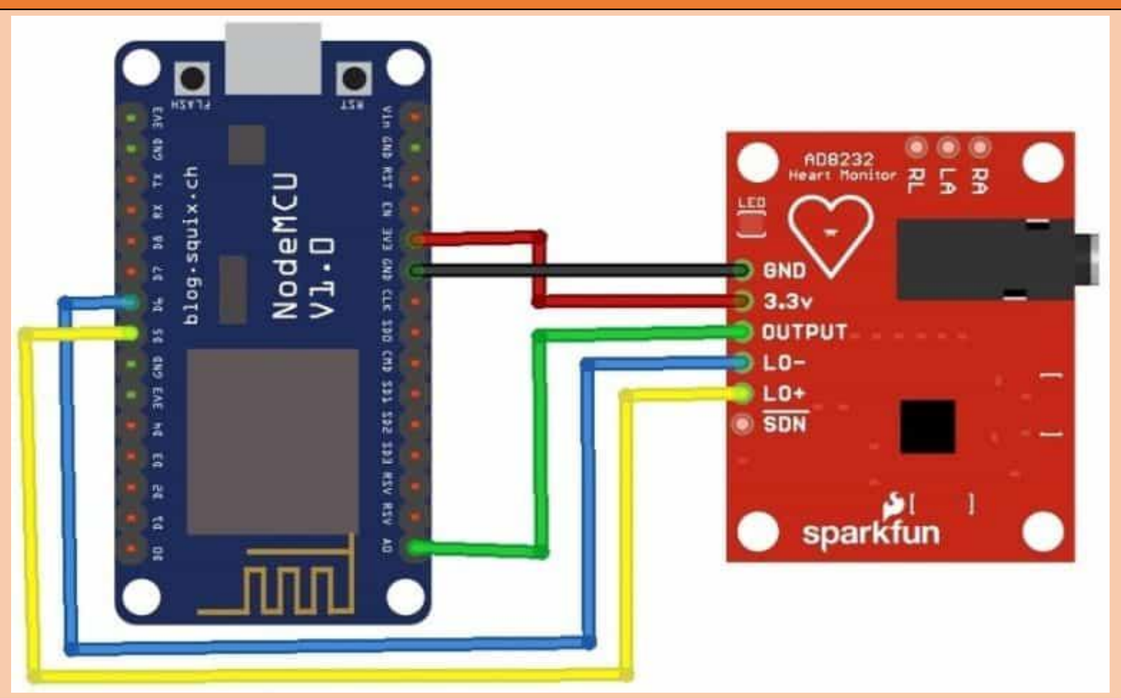
- Describe the electrical conduction system of the heart
- Identify the various positive and negative deflections and describe what each represents in the cardiac cycle
- Type of artifact
- Calculate heart rates from an ECG tracing.

## METHODOLOGY

- In this project we are using NodeMCU(ESP8266-12E Board),ECG Sensor ( AD8232 ECG Sensor Kit),Data Cable (5V Micro USB Data Cable),USB Adapter (5V Volt USB Adapter) and Breadboard.
- First we have installed Node MCU app for computer from which we can upload code
- Then connect NodeMCU
- Then we uploaded program in Node MCU
- Then we takes a breadboard and then we connect ECG sensor and Node MCU to breadboard.
- There is a circuit digram for Interfacing AD8232 ECG Sensor with NodeMCU ESP8266. There are 6 pins in AD8232 Breakout Board. SDN is not connected.
- Connect the OUTPUT to analog A0 of Nodemcu. Connect the LO+ & LO- to D5 & D6 of NodeMCU respectively. Supply the AD8232 kit with 3.3V VCC & Connect its GND.

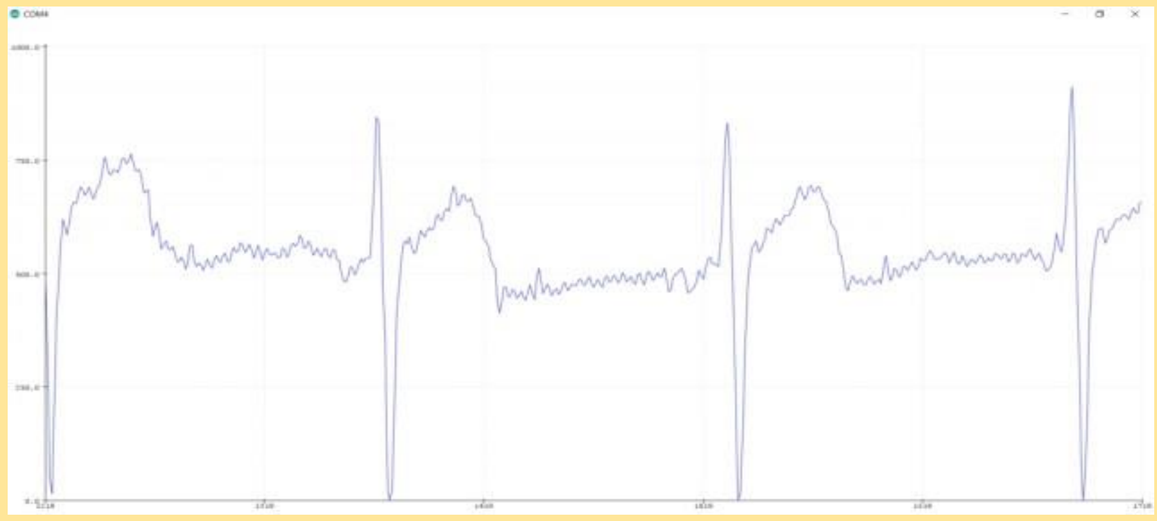



## CIRCUIT DIAGRAM/ SCHEMATICS




## RESULTS AND DISCUSSION

- So we have done all the procedure and we gonna run our's project.
- Once the code is upload, open the Serial Monitor and Set the Buad Rate to 9600. The ECG waveform can be seen below as a visualizations effect on Serial Monitor.



## FUTURE WORK

Using the above code you can visualize the ECG waveform on Serial Plotter Screen. But now we want to visualize the ECG waveform remotely from any part of the world. So for that, I won't need to send the signal generated to any IoT platform. For that I used Ubidots. Using Ubidots you can send data to the cloud from any Internet-enabled device.

So we can say that we in future we dont need to stay with patient because we can measure the heart beat of any heart petient from this process.

## CONCLUSIONS

- We have achieved our's goal like we we are measuring the heartbeat without any expensive medical equipnment or techonology.
- Once the code is uploaded, you can open your serial Monitor. The Serial Monitor is displaying the following lines successfully when we connected the module with Wifi and if Ubidots token is valid.

## REFERENCES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