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IOT-Based ECG Monitoring System

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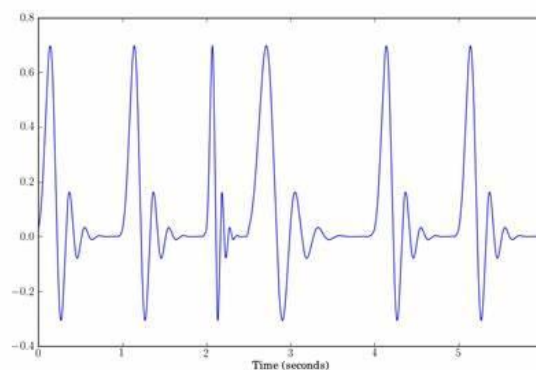
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ABSTRACT: An electrocardiogram is usually used to determine heart-related activities. Heart-related issues are increasing day by day a sudden or unexpected death of people are occurring. By using this health monitoring we can suddenly find out the malformation conditions of the heart. Nowadays Distance between the doctor and patients is the main barrier which causing the trouble with health examine . So this Iot based project will be helpful to examine or to determine the electrical activities of the heart. So we are using Arduinio Nano Noard and ECG sensor

KEYWORDS: Electrocardiogram , Arduinionano ,Ecg Sensor

I. INTRODUCTION

Heart Disease is the term that includes types of heart-related problem. Heart Disease is the leading problem all over the world. This Heart disease affects the heart and blood vessels of the human being .The heart disease are increasing rapidly. Word Health Organization also research and shows that most of elder and older people are dying due to this problem . The heart disease may be increases due to unhealthy food , smoking , high blood pressure ,lack of exercise and more things are affecting . So we cannot take this problem lightly . Day by day this problem is increasing and most of them are affect by this .To overcome this issues most of health monitoring system are available but by using ECG signal it will become easy to prevented this problem .An electrodiogram is also known as ECG or EKG it simple use to record the heart activity This ECG technique is commonly painless and easy to detect the heart related problem.Ecg machine are often use in hospital or clinic room . Now this IOT based system will simple record the activity within our heart .Through its electrical properties we will get information of the intracardiac conducting tissue and reflects the cardiac disease if it is present . An electrode sensor will attach to the body to record the activity . This electrodes of egc sensor will helps us to conversion of heart beat to signal which is electric signal . This sensor are where light weight and easy to use . This electrical signal or activity of the patient will be display on the monitor screen.



II.MOTIVATION

Traditional Ecg machine was very large and stationary equipment in professional medical institution's. This kind of machine usually requires twelve electrodes to collect the ECG data . Moreover, these devices are more expensive for home use, and that's why patients would be frequently visiting the hospital. So our main goal is to develop and to provide maximum convenience to patient during ECG Measurement.

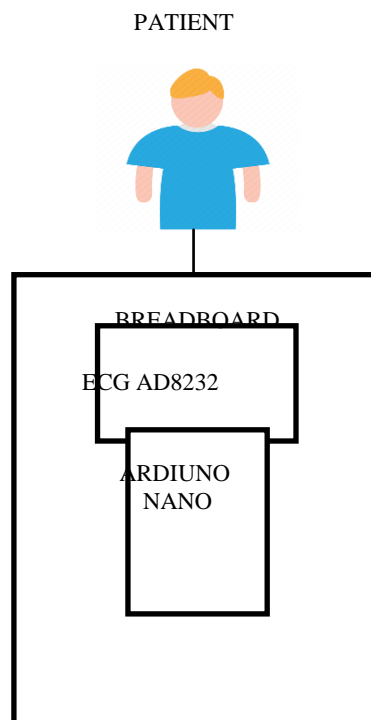
There will be three electrodes use in this system which will use to measure the heart rate of patients and that will display on the screen or monitor of system. It will require a short time to display the result on the screen.

III SYSTEM DESCRIPTION

The Complete information of the proposed system will be explained below. Figure 1 is the block diagram of the system which will tell the whole flow or working of the system. The components used in the ECG system will be divided into two parts : Hardware part and Software part.

Now we will give the briefly information of each components use in this system and also the working of the ECG System. Now following figure is giving the or showing the architecture of Iot Based ECG Monitoring system.

The components used in this system is Arduino Nano , C++ Language and ECG AD8232 Sensor



1 . ECG AD8232 Sensor

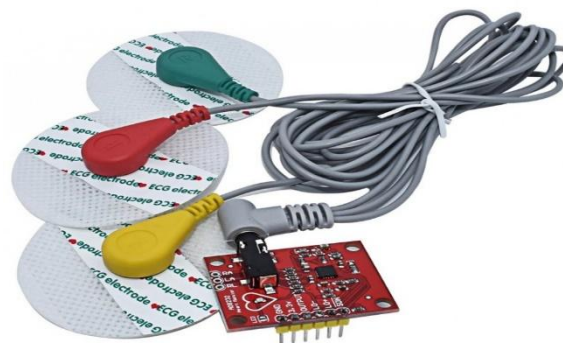


Figure - 2

The AD8232 sensor is the little chip which will be used to measure the electrical signal . The electrical activity will be chart on the monitor in form of analog signal . This AD8232 will be the easy way to obtain the clear signal from the PR and

QR intervals . It is the integrated signal conditioning block for the ECG . The AD8232 module as nine connections from the IC that is been solder , pins , wires or the other connector to SDN , LO + , LO - , OUTPUT , 303V , and GND provides essential pins on the breadboard. Also, it provides the Right Arm, left Arm, and Right leg. This AD8232 ECG sensor is commonly used and it is easy available and affordable component . This is three lead module other ECG module requires or have five and ten leads Placing the electordes on a body is show by following figure - 2

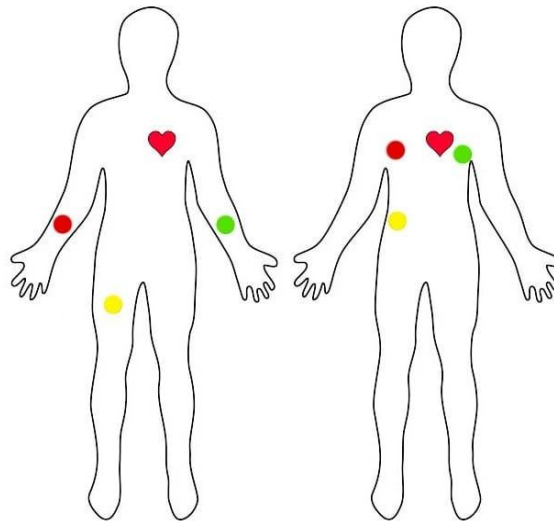


Figure – 3

2 . Arduinio Nano

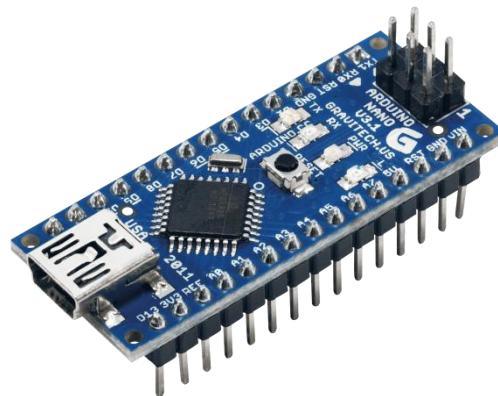


Figure - 4

The Arduinio Nano is a small board which is based on ATmega328P Microcontroller . Its connectivity is same like the Arduinio Uno . Its size is small compared to the Arduinio Uno . It is organized by the Arduinio (IDE) , which can be run on any platforms . The Arduinio (IDE) is need to be install on the Laptop or Desktop to upload the code from Computer to board of Arduinio Nano Board . The Arduinio Nano includes an I/O pins and set of 14 digital pins and 8 analog pins. It also includes 6 power pins and two reset pins .

Now , programming for Arduinionano we will use Arduinio IDE software this program will runs both online and offline.

To run it this Arduinio IDE should be install on your computer device or we can say on your desktop . Then we need USB Cable to connect the Arduinionano board to the desktop . The Serial monitor is added to the Arduinio IDE which will be used to transmit the textual data to or from the board . This Arduinio is software will be used for carrying out serial communication between the computer and board . A part from

serial communication , this board also support the 12c and spi communication . The wire library inside this software is used to support the 12C bus.

II. PSEUDO CODE

- Step 1 : Step 1 is to place the electrodes on the patient .
- Step 2 : Once the electrodes is place on patient body the AD8232 will convert the electrical signal into analog output .
- Step 3 : Then upload the code to arduionano .
- Step 4 : Start the serial monitor on Arduinio IDE Software .
- Step 5 : It start to show the ecg waves of the patient to whom the electrodes is attach .
- Step 6 : This become easy for the doctor to detect the disease and prevent those disease .

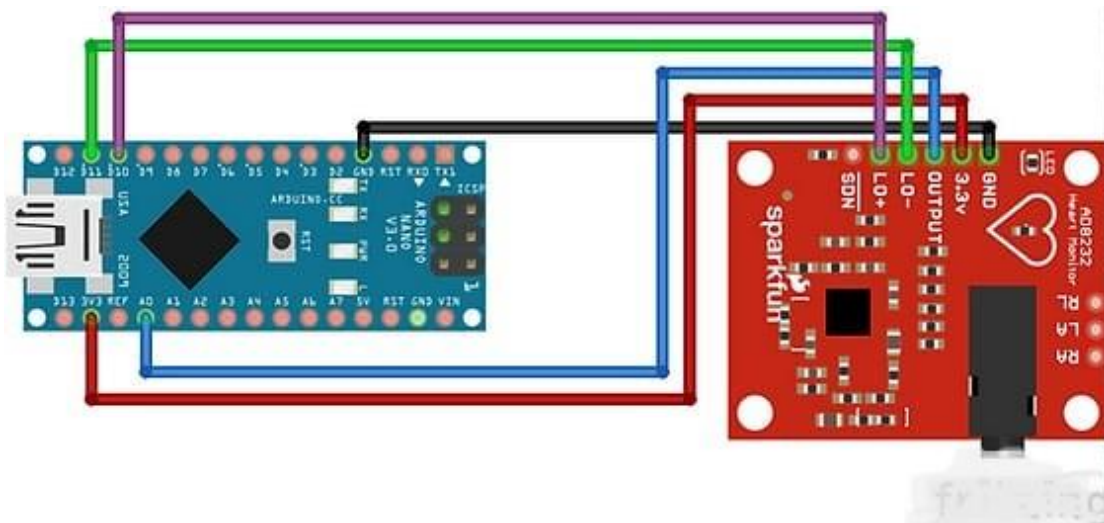


Fig. ECG Monitoring system Circuit Diagram

III. SIMULATION RESULTS

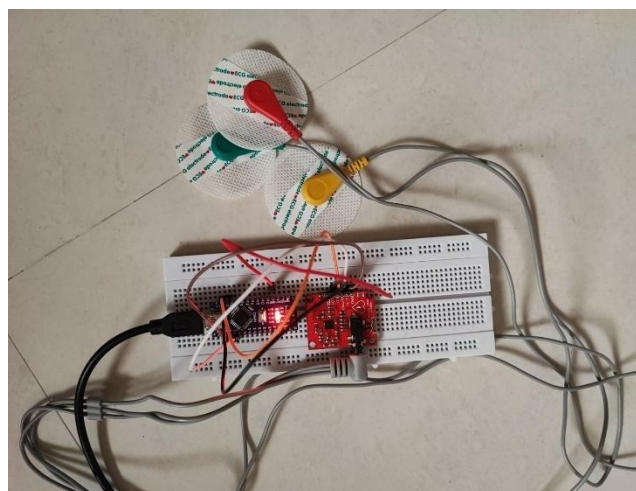


Figure - 5

This is the ECG Monitoring system connection between the electrodes and arduionano board as show in Figure – 5 and this hardware is connected to desktop by using the USB Cable . Also the data received by the System is show in figure – 6

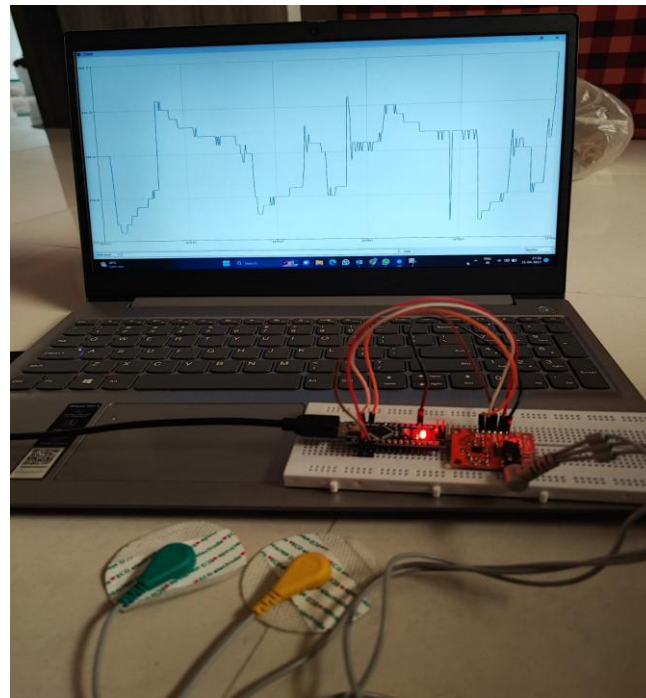


Figure - 6

IV. CONCLUSION AND FUTURE WORK

This paper show the working and the implementation of ECG Monitoring system and also its measure the heart of the patient and also this system is beneficial for the patient and act as the virtual Doctor for the patient . With use of device patient can regularly measure there Ecg and avoid the regularly visiting to the Hospital . And also this device is low cost , time saving and easy to use . More modification can be done in this system and more accuracy will be build . Then we can also use wireless system to system measure the heart rate also we can use the finger tip rather than using the electrodes . Also more update we be in system we can measure plus , temperature and BP .

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