Review Paper on Design & Development of ELETROCARDIOGRAM MACHINE (ECG MODULE MACHINE)

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A B S T R A C T

Second greatest killer in the world is the heart disease. Improvements in diagnosis and treatment tools are welcome by the medical community; one of the most useful diagnostic tools for heart patients is the electrocardiogram, which operates by measuring the tiny electrical signals emitted by the heart through chest electrodes. The goal of this project is to develop a device classified as a " Wireless ECG Monitor" which outperforms currently available devices, It is intended that this very product will go through medical approval and will in a year or two be found saving peoples lives. This device is designed to record single channel of full-spectrum ECG. It stores this enormous amount of information in the memory for further correspondence. Wireless technique is used to remove burden of holter monitor. It can monitor ECG of a patient, who is far apart. The device will analyze ECG for real time and will display On Android Based Mobile

Keywords: ECG, Design, Wireless ECG Monitor.

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1. INTRODUCTION

In the present era a lot of new technologies are on the An electrocardiogram (ECG) is a recording of the electrical activity on the body surface generated by the heart. ECG measurement information is collected by skin electrodes placed at designated locations on the body. The ECG signal is characterized by six peaks and valleys labelled with successive letters of the alphabet P, Q, R, S, T, and U .This article suggests some ideas for a implementation of an ECG monitor. Its configuration is envisaged for use with a personal computer (PC). Alls article is written with patient safety in mind, any ideas presented are not by themselves necessarily compatible with all system safety requirements; anyone using these ideas must ensure that, in a particular design, the design as a whole meets required safety criteria.[1] Mobile-Based Patient Monitoring System provides essential

2. LITERATURE SURVEY

This survey begins by reviewing some of the previous studies in ECG signal feature extraction and analysis techniques. The survey is divided into feature extraction and classification techniques. ECG Feature Extractions The first step in the analysis of ECG signal is the denoising of ECG signal. Denoising or pre processing of ECG signal is important because noise severely limits the utility of the recorded ECG. After pre-processing, the second stage towards classification is to detect certain features of ECG signals mostly QRS complex, P and T waves. The features, which represent the classification information contained in the signals, are used as inputs to the classifier used in the classification stage. The goal of the feature extraction stage is to find the smallest set of features that enables acceptable classification rates to be achieved. In general, the developer cannot estimate the performance of a set of features without training and testing the classification system. We hypothesise that the prevalence of severe QTc prolongation, Brugada ECG, and ERP, are increased in people with epilepsy; this may (partly) explain the higher SCA risk in epilepsy

3. AIM OF PRESENT WORK

Main aim

Heart disease was becoming a big disease which health killer people for many years.World Health Organization (WHO) research also shows that the most people was dying due to heart disease. Therefore, This disease can not be taken lightly. Hence, most health care equipment and monitoring system are designed to keep track the disease. Aswe know that by analyzing or monitoring the ECG signal at initial stage these disease can be prevented.So I am working in this project .

COMPONENTS USE IN PROJECT

- **ARDUINO NANO**
- **HC-05 BLUETOOTH MODULE**
- **BREADBOARD BOX CIRCUIT**
- **BATTERY HOLDER**
- **CONNECTOR CABLE OR JUMPER CABLES/WIRE**
- **USB CABLE**
- **ANDROID BASED SMART PHONE**

Figure 1 Arduino nano

The Nano Board R3 with CH340 chip without USB Cable chipboard is based on the famous Arduino platform and does allthe functions of Uno, but with a smaller footprint. The Nano Board R3 with CH340 chip without USB Cable is vital foryour small project where you don't need much of a pin-outs but the small size is very important to make it look good.
This Nano equips a low-cost USB-Serial Chip that makes it less inprice than Nano with FTDI USB-Serial Chip used on older versions of Arduino Nano. The Nano Arduino is a small, complete, and breadboard-friendly board based on the ATmega328 (Nano R3). It has more or less the same functionality of the Uno but in a different package. It lacks only a DC power jack and works with a Mini-B USB cable instead of a standard one
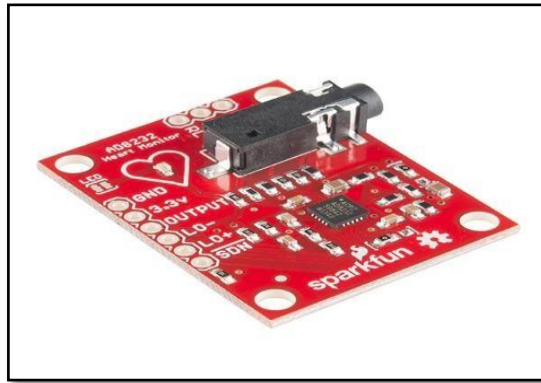
ECG MODULE (AD8232) SPECIFICATIONS:

The AD8232 module breaks out nine connections from the IC that you can solder pins, wires, or other connectors to. SDN, LO+, LO-, OUTPUT, 3.3V, GND provide essential pins for operating this monitor with an Arduino or other development board. Also provided on this board are RA (Right Arm), LA (Left Arm), and RL

(Right Leg) pins to attach and use your own custom sensors. Additionally, there is an LED indicator light that will pulsate to the rhythm of a heartbeat.

Heart diseases are becoming a big issue for the last few decades and many people die because of certain health problems. Therefore, heart disease cannot be taken lightly. By analyzing or monitoring the ECG signal at the initial stage this disease can be prevented. So we present this project, i.e ECG Monitoring with AD8232 ECG Sensor & Arduino with ECG Graph.

The AD8232 is a neat little chip used to measure the electrical activity of the heart. This electrical activity can be charted as an ECG or Electrocardiogram. Electrocardiography is used tohelp diagnose various heart conditions.

Bluetooth Module HC-05
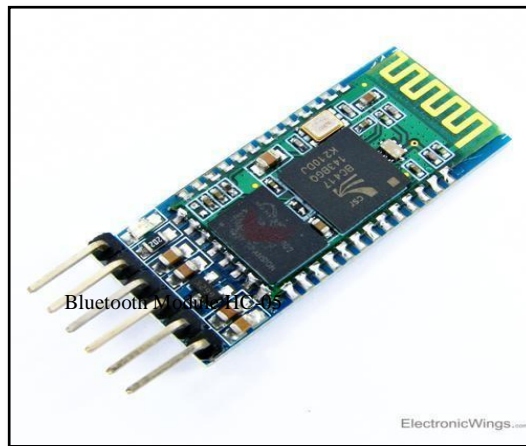
It is used for many applications like wireless headset, game controllers, wireless mouse, wireless keyboard and many more consumer applications. It has range up to <100m which depends upon transmitter and receiver, atmosphere, geographic & urban conditions. It is IEEE 802.15.1 standardized protocol, through which one can build wireless Personal Area Network (PAN). It uses frequency-hopping spread spectrum (FHSS) radio technology to send data over air. It uses serial communication to communicate with devices. It communicates with microcontroller using serial port (USART). HC-05 Specifications circuit connection

Arduino Nano R3	Hc-05
Gnd	Gnd
5 V pin	5v
Digital pin 3	Tx
Digital pin 2	Rx

Arduino Nano R3	ECG sensor AD8232
Gnd	Gnd
3.3V	3.3V
Analog Pin A0	Output
Digital Pin 11	Lo-
Digital Pin 10	Lo+
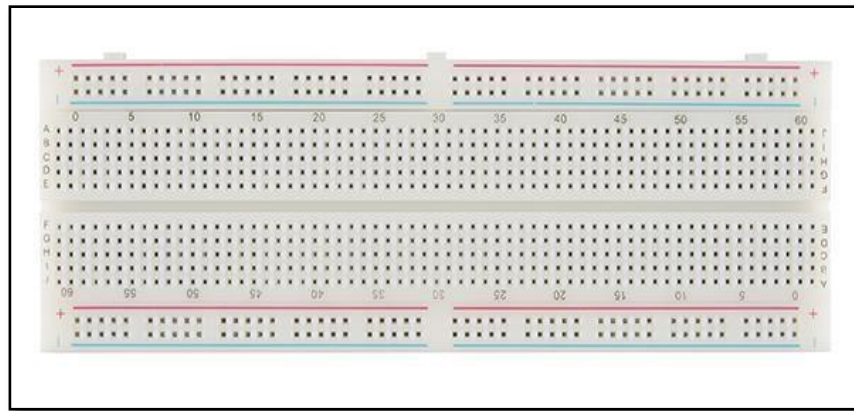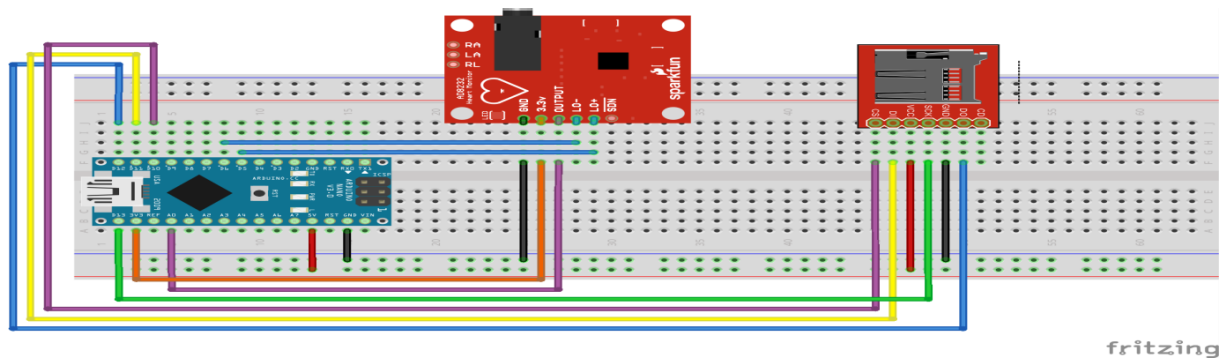
BREADBOARD CIRCUIT

Most breadboards have some numbers, letters, and plus and minus signs written on them. What does all that mean? While their exact appearance might vary from breadboard to breadboard, the general purpose is always the same. These labels help you locate certain holes on the breadboard so you can follow directions when building a circuit. If you have ever used a spreadsheet program like Microsoft Excel® or Google Sheets™, the concept is exactly the same. Row numbers and column letters help you identify individual holes in the breadboard, just like cells in a spreadsheet. For example, all of the highlighted holes are in "column C
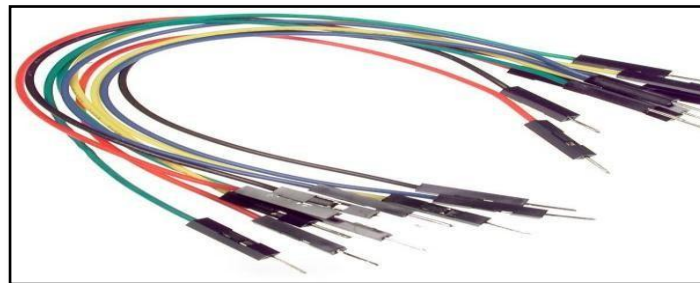
JUMPER WIRES

A jump wire (also known as jumper, jumper wire, jumper cable, DuPont wire or cable) is an electrical wire, or group of them in a cable, with a connector or pin at each end (or sometimes without them – simply "tinned"), which is normally used to interconnect the components of a breadboard or other prototype or test circuit, internally or with other equipment or components, without soldering.[1]

Stranded 22AWG jump wires with solid tips.

Individual jump wires are fitted by inserting their "end connectors" into the slots provided in a breadboard, the header connector of a circuit board, or a piece of test equipment. Differences between cohorts in baseline characteristics and ECG parameters were analysed using χ2 statistics for categorical variables (Pearson/Fisher's Exact test where appropriate) and Student t test/Mann–Whitney U test for continuous variables. We

performed multivariate logistic regression models to determine whether epilepsy was independently associated with Brugada ECG, severe QTc prolongation, or ERP. We employed two models: the first included all determinants that were univariately associated ($p<0.1$) with outcome, whereas the second model included only those determinants that also changed the point estimate by $\geq5\%$. As severe QTc prolongation was not seen in controls, we used penalised logistic regression analysis to perform multivariate analysis applying the same strategy as above

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