Medical Multiparakit to an Android Application

Ms. E. Niranjana[1], M.Sreemol[2], E.Sivaranjani[2], P.Isaiyarasan[2], R.Arun[2]

[1]*(Department of BME, Rajiv Gandhi College of Engineering and Technology, India)*
[2]*(Department of BME, Rajiv Gandhi College of Engineering and Technology, India)*
Corresponding Author: Ms. E. Niranjana

Abstract: The medical multiparakit is a device which is used to calibrate the basic parameters of the body. The device enables the people from pastoral region to disseminate the recorded parameters in android app to the medical practitioner of the pastoral region. The body variables values will be crosschecked with the standard varaibles values and will be perusaled by the medical practitioner. This also aids the normal people to know their body condition being at home. They give the momentous difference between the normal and abnormal body variables.

I. Introduction

The first and the foremost step to find whether the patient is in normal or abnormal stage is by using the 6 classic vital signs which is also called the six-minute warning. The six vital signs are heart rate, ECG waveform, oxygen saturation level, respiration rate, temperature, height and weight. These are being used on the historical basis and currently being used for basic body examination. From the recent survey we can study that the major cause of death is heart related problem like Myocardial Infraction and Ischemic Heart Disease. Normally heart attack occurs when the systole, diastole and heart muscle ruptures, this causes the minimal flow of blood to the other parts of the body. An heart attack happens when the flow of oxygen rich blood to a section of heart muscle suddenly becomes blocked and the heart can't get enough oxygen. If blood flow isn't restored quickly then the section of heart muscle begins to die. If the protein level in the blood is high it also causes heart attack. In olden days they used to read all the vital signs of the body by just using the pulse rate from the hand's wrist, this will merely be impossible to accurately say what the problem is and origin of the problem. For this, many devices where being found. Willem Einthoven was a Dutch medical practitioner and physiologist. He invented the first practical electrogram (ECG or EKG) in 1985. In our project the medical multimeter device can save life's of 1,00,000 - 25,00,000 people from grave danger. Normally to calibrate ECG of a patient they use highly equipped ECG machine. The cost of the scanning is high, but using the max 30100 sensor(heart rate+ spo2)we can view the patient ECG through the android application. Normally the distance of the machine from the patients 5-10 meters far. The power supply being used here is 2-3.3 V.

II. Objective

The objective of the project is to the help the pastoral region people as well as the medical practitioner to know the problem and aid them with medication. They can instantly give the waveform and values of the body parameter like heart rate blood pressure etc. We use the two to three sensors which is of compact size and portable and can be charged. This give accurate value when compared to the available vast machine .And by this we have achieved our purpose.

III. Existing method

In the existent technique, directly the sensors will be connected to the OLED display, which display the required body variable value. We can select which parameter and find the values . It can only give the output only when we touch the sensor with finger it sense and give the value. Here individual sensors are being used to generate the value. The power supply given here is of 3.3v. The connections and conductivity are within center distance .Here the sensor is being controlled by the arduino UNO microcontroller. The existent technique has arduino, OLED display and heart rate sensor.
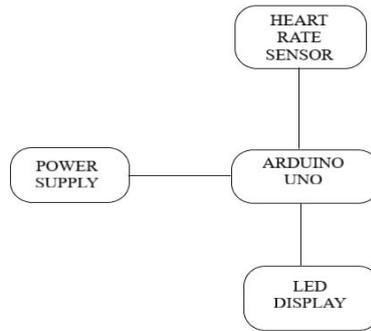

IV. Proposed model

In the proposed model the arduino will be connected with the sensors which will be connected to the mobile through the Bluetooth module, the Bluetooth will directly pass the received waveforms or values to the bluetooth module in the nano arduino microcontroller. The components we use in our project are of low cost and good efficiency, the components are

➤ Nano aurdino microcontroller
➤ ECG sensor
➤ Max30100
➤ Temperature sensor
➤ Android application

Block depection
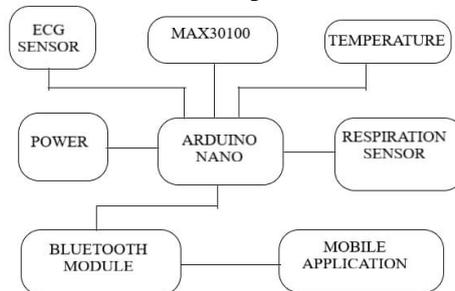
V. System Description

Arduino Nano

ATMEGA is a single chip microcontroller made by Atmel in the family megaAVR. It has an altered equipment engineering. It is an 8-piece and 28 pins AVR Microcontroller, pursues RISC Architecture and it has program memory of 32KB.

The Arduino Nano is a compact board similar to uno .The Arduino Nano is a small, complete, and bread-board friendly board based on the ATmega328P(Arduino Nano 3.x).the key difference between arduino UNO and Arduino Nano is that the nano has two extra analog pins, A6 and A7, but the UNO uses an ATmega with 328P with 28 pins.Functions like pinMode() and digitalWrite() are used to control the operations of digital pins while analogRead() is used to control analog pins.

It goes about as an interface. Outer (non-USB) power can come either from AC to DC connector (divider mode) or battery. The connector can be related by halting 2.1mm center positive fitting into the boards ability jack. Leads from the battery can be implanted in the Gnd and vin stick header of the power connector
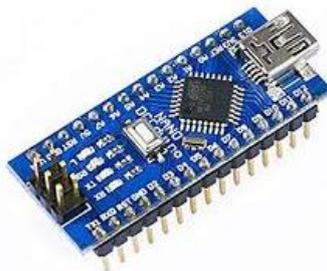
Arduino nano

Arduino Nano with a crystal oscillator of frequency 16Mhz.They operate at 5volts. Each pin can provide or receive a maximum of 40mA. This arduino which is used to convert the analogy signals into digital signals which will be display in the mobile using the arduino synced android coding.

ECG sensor

An ECG is a non invasive, painless test with quick results. During an ECG, sensors(electrodes) that can detect the electrical activity of your heart are attached to your chest and sometimes your limbs. ECG records the electrical activity generated by heart muscle depolarization's, which propagate in pulsating electrical waves towards the skin.ECG electrodes are typically wet sensors, requiring the use o a conductive gel to increase conductivity between skin and electrodes. They play a major role, it records the heart rhythm which will be displayed using the android application.

A) ECG sensor
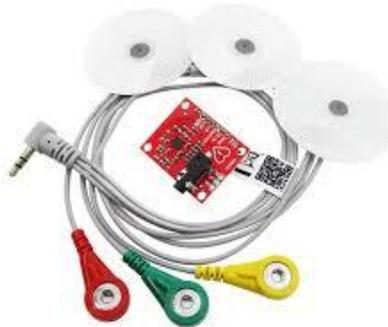
A) ECG electrodes (button electrode and suction electorde)

Max 30100

The MAX30100 is an integrated pulse oximetery and heart-rate monitor sensor solution. It combines two LED's photo detector, optimized optics and low-noise analog signal processing to detect pulse oximetery and heart-rate signals.

MAX30100 operates on a supply in the range of 1.7 to 2V. It reduces power consumption and visible light emission when the user's finger is not on the sensor. Ultra-low power operation increases battery life for wearable devices. Application of MAX30100 is, fitness assistant devices, medical monitoring devices and wearable devices.

Thermistor

A Thermistor is a type of resistor whose resistance is dependent on temperature more more so than in standard resistors. It is widely used as inrush current limiters. Temperature sensors are self – resetting over current protectors and self regulating heating elements. The typical operating temperature range of a thermistor is -55 deg C to +150 deg C through some glass- body. Thermistor have a maximal operating temperature of +300 deg C. The greater precision is acquired within a limited temperature range from -90 deg C to 130 deg C.

Temperature sensor

A Temperature sensor is a device, usually an RTD(resistance temperature detector) or a thermocouple, that collects the data about temperature from a particular source and converts the data into understandable form for a device or an observer. These types of temperature sensor use convection and radiation to monitor changes in temperature. For applications in the temperature range -50 C to 250 C, platinum RTD's have the highest cost of upto $6. The working base of the sensors is the voltage that read across the diode.

Android applications

An Android app is a software application running on the Android platform. Because the Amdroid platform is built or mobile devices, a typical Android app is designed for a smartphone or a tablet PC running on the Android OS. Android apps are written in the Java programming language and use Java core libraries. In our project the arduino will be laden with a program which will be synced with the android application.

VI. Results And Conclusion

The paper review the advantages and the cost efficient medical multiparakit. The purpose of the kit is to reduce the time and cost. Usually it consumes more time to calculate each body variables. But by using this kit we can read each body variables individually when required. Since its being connected to the mobile it is more convenient to view the value.

REFERENCES

[1]. Muhammad Khairul Nizar Bin Khairuddin;KazuhiroNakamoto;HiroshiNakamura;KanyaTanaka;ShotaNakashima."Heart rate and heart rate variability measuring system by using smartphone",2017 2nd Intl conf on bigdata (ACIT- CSI) international conference.
[2]. Mas AzalyaYusof;Yuan Wen Hau. "Mini home based vital sign monitor with Android Mobile Application(My vital gear)",Publiction:2018 IEEE-EMBS Conference on Biomedical Engineering and Science(IECBES).
[3]. Prajaka A. Pawar, " Heart rate Monitoring System using IR base sensor & Arduino UNO", 2014 Conference on IT in business, Industry and Government (CSIBIG) .
[4]. Kerim Bedri Sacanve Gokhanertas."Performance assessment of MAX 30100 SpO2 / Heartrate Sensor". 2017 Medical Technologies National Congress (TIPTEKNO).
[5]. Hossein Mamaghanian;NadiaKhaled;DavidAtienza;PierreVandergheynst. "Compressed Sensing for Real-Time Energy-Efficient ECG Compression on Wireless
[6]. Body Sensor Nodes". Journals & Magazines IEEE Transactions on Biomedical , Volume:58 Issue: 9.
[7]. Chacko John Deepu; XiaoyangZhang ; Chun HuatHeng; Yong LianLian. " A 3- lead ECG- on-chip with QRS Detection and Lossless Compression for Wireless Sensors". Journals and magazines IEEE transaction on citcuits Volume:63 Issue:12.