REAL TIME HEART ATTACK DETECTION SYSTEM WITH AED DEVICE ALERT WITH IOT

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1.ABSTRACT:

To the existence and influence, health related parameters and issues are of utmost importance to man. Various systems have been developed that are able to capture and monitor changes in health parameters. A real time remote monitoring of heart rate is presented in this paper. This system uses an alert and LCD display that are capable of monitoring the heart rate. A low cost, efficient and flexible heart rate detection and alert system using wireless module has been implemented in this paper.

The sensors sense and measure the heart rate and detected signals are sent to control unit for further processing. The controller displays the heart rate on LCD which is then proceeded to alert system. If there is a large difference between the normal and measured heart rates, then an alert will be provided by the system. This system is continuous, real time, safe and accurate in monitoring the heart rates.

In this system further application is attached for preventing system that name was AED (Automatic External Defibrillator). In case any low level beat is detects the defibrillator will give the shock on external body of the patients. After the shock the notification is send to the corresponding doctor. And voices also speak at the ICU unit if the patient is admitted in hospital.

The need for good patient care in hospitals, assessment, and management of fluid and electrolyte is the most fundamental thing required. All most in all hospitals and assist/nurses are responsible for monitoring the electrolyte bottle level. But unfortunately most of the time, the observer may forget to change the bottle at the correct time due to their busy schedule. To overcome this critical situation, an IoT based automatic alerting and indicating the device is proposed where the sensor used here is a level sensor or weight sensor. It is based on the principle that the sensor output changes when fluid level/weight is below a certain limit. When Fluid level/weight is low, it will alert the observer through the website at the control room indicates the room number of the patient for quick recovery

2.INTRODUCTION:

We are developing a system which will help to decrease the death rate due to heart attack by early detection of heart attack. In our system we will be using smart bands/ health bands which are easily available in market. These smart bands will continuously monitor heart rate of a user. When the heart rate of a user goes below a danger value, the near smart phone will get notified and the application installed in the smartphone will notify to concerned people of the user and will also notify to ambulance service. The smart band and the application will be connected by AOT. This work proposes a wireless sensor network design for real-time monitoring and detection cardiovascular disease. This system incorporates wireless sensor network technology with other wireless technologies such as cellular network, wireless LAN, and broadband network, for efficient and fast delivery of health alerts. This proposed system consists of a wearable wireless sensor system, control system, heterogeneous wireless network system, two phase real-time data analysis and visualization system, and the warning system. All these together will provide the ECG signal analysis of a cardiac patient, remote monitoring, delivery of warning to a doctor, relative, and the hospital, and an extended service of transferring the ECG signals and previous records of the patient to his doctor in a remote location. This system can be used for providing enhanced healthcare services to the rural areas of the developing countries that are facing shortage of efficient specialized doctors. Thus the cardiovascular disease causing the death of patient can be reduced immensely by the implementation of this proposed system, in both rural and urban areas. Recently, the research of Human-Health monitoring systems has moved from basic reasoning of wearable sensor readings to the advanced level of data processing to give more information that is valuable to the end users either to doctor or to patient.

3.LITERATURE SURVEY

IN[1] **International Journal of Innovations in Engineering and Technology (IJIET), , mamidhi manisha, B.Tech Student, Department of Information Technology VR Siddhartha Engineering College, Kanuru, Andhra Pradesh, India, ISSN: 2319 – 1058, Volume 7 Issue 2 August 2016**

In this project we are implementing a heartbeat monitoring and heart attack detection system using the Internet of things. These days we have an increased number of heart diseases including increased risk of heart attacks. The sensor is then interfaced t o a microcontroller that allows checking heart rate readings and transmitting them over internet.

IN[2] **International Journal of Computer Applications (0975 – 8887), Arvind Prakash Project Engineer, Livikodez Bangalore, Karnataka, India, Volume 170 – No.5, July 2017**

The IoT will be one of the important trends in future, can affect the networking, business and communication. In this paper, proposing a remote sensing parameter of the human body which consists of pulse and temperature. The parameters that are used for sensing and monitoring will send the data through wireless sensors. Adding a web based observing helps to keep track of the regular health status of a patient. The sensing data will be continuously collected in a database and will be used to inform patient to any unseen problems to undergo possible diagnosis. Experimental results prove the proposed system is user friendly, reliable, economical.

IN[3] **INTERNATIONAL JOURNAL OF TECHNOLOGY ENHANCEMENTS AND EMERGING ENGINEERING RESEARC H, VOL 1, ISSUE 3,ISSN 2347-4289, Md. Ashrafuzzaman, Md Mazaharul Huq, American International, University-Bangladesh, Dhaka University**

Heart attack is a global leading cause of death for both gender and the occurrence is not always known to us. Usually Heart Rate Calculation has traditionally been conducted using specialized hardware or device. It used most commonly in the form of pulse oximeters or Electrocardiogram devices. though these devices have higher method and they are reliable to normal user. However, these devices require users to perform their process. In this paper, we propose a system capable of estimating the heart beat rate using just a camera from a commercially available s mart phone and also using a mobile stethoscope to record heart sound for detecting the occurrence of heart attack and also some ot her heart related disease. Fuzzy Logic is used here, which is a part of Data Mining, the expert problem solution for human illness. In general, case people could not Understand whenever they face this problem and this is the main cause of death. Our research is about to determine this problem earlier to reduce the death rate of heart attack. The advantage of this method is that the user does not need specialized hardware and he/she can take a measurement in virtual ly any place under almost any circumstances. In addition, the measurement can be used as a tool for health coaching applications or effective telecare services aimed in enhancing the user's well being

4.BLOCK DIAGRAM
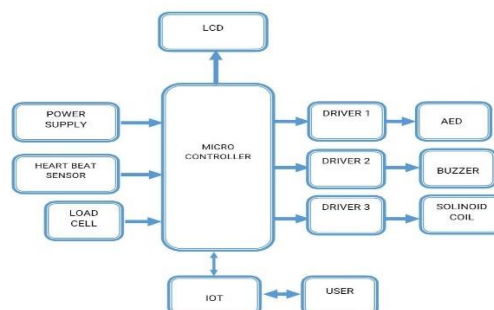
EXPLANATION:

In this system the further application is attached for preventing system that name was AED (Automatic External Defibrillator). In case any low level beat is detects the defibrillator will give the shock on external body of the patients. After the shock the notification is send to the corresponding doctor. And voices also speak at the ICU unit if the patient is admitted in hospital.

In this system have a two segments. One is the transmitting segment which is with patient and the other is receiver segments which is being supervised by the doctor or nurse. The system makes use of heart beat sensor to find out the current heart beat level and display it on the LCD screen. The transmitting circuit include microcontroller interfaced to LCD screen and this transmitting circuit is powered by 6v battery. Similarly, the receiving circuit includes AOT. It includes a buzzer which is used to alert the person supervising the heartbeat rate of patient does not fall within the normal heart beat level set. The inherent noise signal was eliminated using a low pass filter. The device is portable, durable, flexible, reliable and cost effective. Also, it is efficient, easily estimable data and easy-to-use for the end user. Experimental results have shown acceptable range with actual heartbeat rates.

5.COMPONENTS

MICRO CONTROLLER
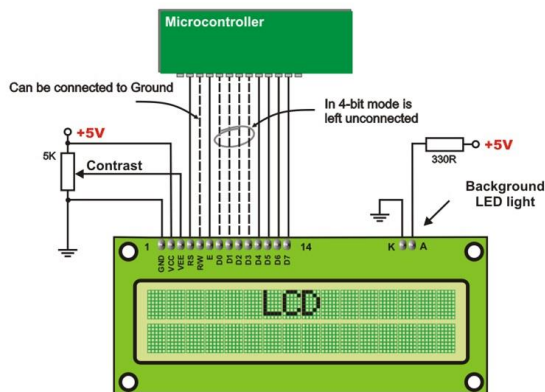
ESP8266EX delivers highly integrated Wi-Fi SoC solution to meet the continuous demands for efficient power usage, compact design and reliable performance in the industry. With the complete and self-contained Wi-Fi networking capabilities, It can perform as either a standalone application or the slave to a host MCU. When ESP8266EX hosts the application, it promptly boots up from the external flash. The integrated high-speed cache helps to increase the system performance and optimise the system memory. Also, ESP8266EX can be applied to any micro-controller design as a Wi-Fi adaptor through SPI / SDIO or I2C / UART interfaces.

ESP8266EX integrates antenna switches, RF balun, power amplifier, low noise receive amplifier, filters and power management modules. The compact design minimise the PCB size and allows for minimal external circuitry. Besides the Wi-Fi functionalities, ESP8266EX also integrates an enhanced version of Tensilica's L106 Diamond series 32-bit processor and on-chip SRAM. It can be interfaced with external sensors and other devices through the GPIOs. Software Development Kit (SDK) provides sample codes for various applications

FILTER

The output after being processed by full wave rectifier is not a pure DC. The output is a pulsating DC. The output contains large fluctuations in voltages. This is quite apparent from the block of full wave rectifier shown above. The power supply that we intend to design must not have any variation in output voltage. The voltage that we get from full wave rectifier fluctuates between 0 V and V_{peak}, and hence it contains AC components. These AC components needs to be filtered out so as to obtain DC voltage. This is where filters come into picture. Filters, as the name suggests, filters out any AC component present and provides DC as the output. However, the output from the filter is still not a pure DC but filters removes the AC component in the voltage to a considerable extent. This increases the average DC value of the output voltage. Now a question

must arise as to how we can make a filter and which components are required to make a filter.

IC Voltage Regulators

Voltage regulators comprise a class of widely used ICs. Regulator IC units contain the circuitry for reference source, comparator amplifier, control device, and overload protection all in a single IC. Although the internal construction of the IC is somewhat different from that described for discrete voltage regulator circuits, the external operation is much the same. IC units provide regulation of either a fixed positive voltage, a fixed negative voltage, or an adjustably set voltage.
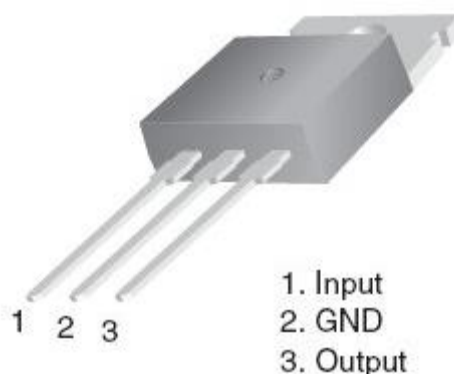

POWER SUPPLY MODULE

There are various factors that determine the quality of the power supply like the load voltage, load current, voltage regulation, source regulation, output impedance, ripple rejection

HEART BEAT SENSOR

A **heart rate monitor** is a personal monitoring device that allows one to measure his or her heart rate in real time or record the heart rate for later study. It is largely used by performers of various types of physical exercise.
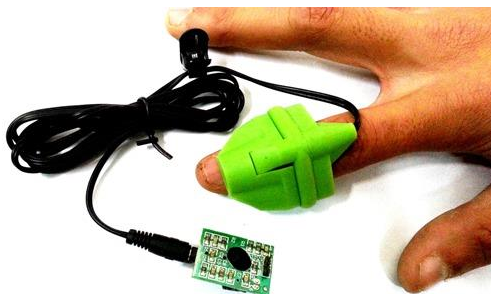
LCD

LCD (Liquid Crystal Display) screen is an electronic display module and find a wide range of applications. A 16x2 LCD display is very basic module and is very commonly used in various devices and circuits. These modules are preferred over seven segments and other multi segment LEDs

> ➢ LCDs are economical
>
> ➢ Easily programmable
>
> ➢ Have no limitation of displaying special characters.
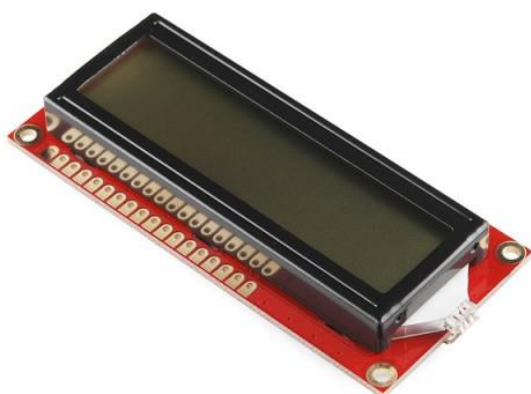
DEFIBRILLATOR (AED)

An AED at a railway station in Japan. The AED box has information on how to use it in Japanese, English, Chinese and Korean, and station staff are trained to use it.

Automated external defibrillators are designed for use by untrained or briefly trained laypersons. AEDs contain technology for analysis of heart rhythms. As a result, it does not require a trained health provider to determine whether or not a rhythm is shockable. By making these units publicly available, AEDs have improved outcomes for sudden out-of-hospital cardiac arrests.

Trained health professionals have more limited use for AEDs than manual external defibrillators. Recent studies show that AEDs does not improve outcome in patients with in-hospital cardiac arrests. AEDs have set voltages and does not allow the operator to vary voltage according need. AEDs may also delay delivery of effective CPR. For diagnosis of rhythm, AEDs often require the stopping of chest compressions and rescue breathing. For these reasons, certain bodies, such as the European Resuscitation Council, recommend using manual external defibrillators over AEDs if manual external defibrillators are readily available.

6. SOFTWARE IMPLEMENTATION

ARDUINO IDE is a software program that runs on a PC to develop applications for Microchip Microcontrollers. It is called an Integrated Development Environment, or IDE, because it provides a single integrated "environment" to develop code for embedded microcontrollers.

An embedded system is typically a design making use of the power of a small microcontroller. These microcontrollers combine a microprocessor unit (like the CPU in a desktop PC) with some additional circuits called "peripherals", plus some additional circuits on the same chip to make a small control module requiring few other external devices. This single device can then be embedded into other electronic and mechanical devices for low-cost digital control.

7.CONCLUSION

This paper presents a real-time wireless sensor network system for monitoring and detecting any upcoming cardiovascular disease. The system has the capability to monitor multiple patients at a time, to deliver remote diagnosis and prescriptions, and also for providing fast and effective warnings to doctors, relatives, and the hospital. The system design consists of wearable wireless sensor node, mobile control unit,

heterogeneous wireless network system, two phase data analysis and visualization system, and the warning system. The system is also capable to collect the data according to perceived health risk in each patient. Especially this system will be useful before, during, and after a cardiac arrest for continuous monitoring of a patient in the remote location. The system will contribute in the reduction of death due to heart attack and other cardiovascular diseases; also it can be used for providing health service by specialized doctors, to rural areas. Comparatively, this system can be produced in low cost, since it only needs to develop a wearable wireless sensor system, the software platforms, and the development of data storage capability. The system utilizes the available wireless network for the data transmission, which contributes to the cost reduction. In future, the current system will be tested and validated in Amrita School of Medical Sciences. The current system will be modified later, by incorporating other sensors, to monitor blood pressure, diabetes, and respiration process, to reduce false alarms.

8.REFERENCES

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