Heart Attack Detection & Heart Rate Monitor Using IoT

R.Arunkumar[1], C.Karrupasamypandian[2],K.Kalyanakumar[3],M.Madasamy[4]
Assistant Professor[1], UG Student[2,3,4]
Department of ECE, PSR Engineering College Sivakasi

Abstract: Now a days we have an increased number of heart diseases including increased risk of heart attacks. Our proposed system users sensors that allow to detect heart rate of a person using heartbeat sensing even if the person is at home. The sensor is then interfaced to a microcontroller that allows checking heart rate readings and transmitting them over internet. The user may set the high as well as low levels of heart beat limit. After setting these limits, the system starts monitoring and as soon as patient heart beat goes above a certain limit, the system sends an alert to the controller which then transmits this over the internet and alerts the doctors as well as concerned users. Also the system alerts for lower heartbeats. Whenever the user logs on for monitoring, the system also displays the live heart rate of the patient. Thus concerned ones may monitor heart rate as well get an alert of heart attack to the patient immediately from anywhere and the person can be saved on time.
Keywords: Heart rate sensor, monitor, detect, IoT, android smart phone.

I. INTRODUCTION:

The heart attack detection and heart rate monitoring is mainly intended for reducing the heart disease**.**Now a days we have an increased number of heart diseases including increased risk of heart attacks. Our proposed system users sensors that allow to detect heart rate of a person using heartbeat sensing even if the person is at home. Whenever the user logs on for monitoring, the system also displays the live heart rate of the patient.Thus concerned ones may monitor heart rate as well get an alert of heart attack to the patient immediately anywhere and the person can be saved on time.

II. IMPLEMENTATION:

A. The Arduino Uno:

Arduino uno, it is a microcontroller board. It is based on ATmega328. Moreover, there are 14 digital input and output pins of which six can be usaged as PWM outputs. RX and TX pins are utilize for communication between arduino board, computer or additional devices for serial communication. It has operating voltage of 5V.The ATmega 328 has 32KB of flash memory for storing code. The ICSP(in-circuit serial programming) header will permit us to use an outside programmer to upload software to our microcontroller unit.

B. Pulse Sensor:

For arduino, the pulse sensor is plug and play heart rate sensor. It can be utilized by any persons who want to simply include live heart rate information into their developments. The sensor displays the movement of blood through the finger and is intended to give numerical output of heart beat once a finger is positioned on it.

C. NodeMCU ESP 8266:

The Node Microcontroller Unit (NodeMCU) is open source software and hardware enlargement
background that is constructed everywhere a very inexpensive system on a chip named the ESP8266. In our System we have used NodeMCU to receive data from Arduino and send that data over internet.

D.USB Serial Communication Bus:

USB communications device class (or USB CDC) is a composite Universal Serial Bus device class. The class may include more than one interface, such as a custom control interface, data interface, audio, or mass storage related interfaces. The communications device class is used for computer networking devices akin to a network card, providing an interface for transmitting Ethernet or ATM frames onto some physical media. It is also used for modems, ISDN, fax machines, and telephony applications for performing regular voice calls.

III. SOFTWARE REQUIRED:

ARDUINO IDE:

The Arduino **integrated development environment (**IDE**)** is a cross-platform application (for Windows, macOS, Linux) that is written in the programming language Java. It is used to write and upload programs to Arduino board. The source code for the IDE is released under the GNU_General_Public_License, version 2. The Arduino IDE supports the languages C and C++ using special rules of code structuring. The Arduino IDE supplies a software_library from the Wiring project, which provides many common input and output procedures. User-written code only requires two basic functions, for starting the sketch and the main program loop, that are compiled and linked with a program stub main() into an executable cyclic_executive program with the GNU_toolchain, also included with the IDE distribution. The Arduino IDE employs the program avrdude to convert the executable code into a text file in hexadecimal encoding that is loaded into the Arduino board by a loader program in the board's firmware.

IV. PROBLEM DESCRIPTION:

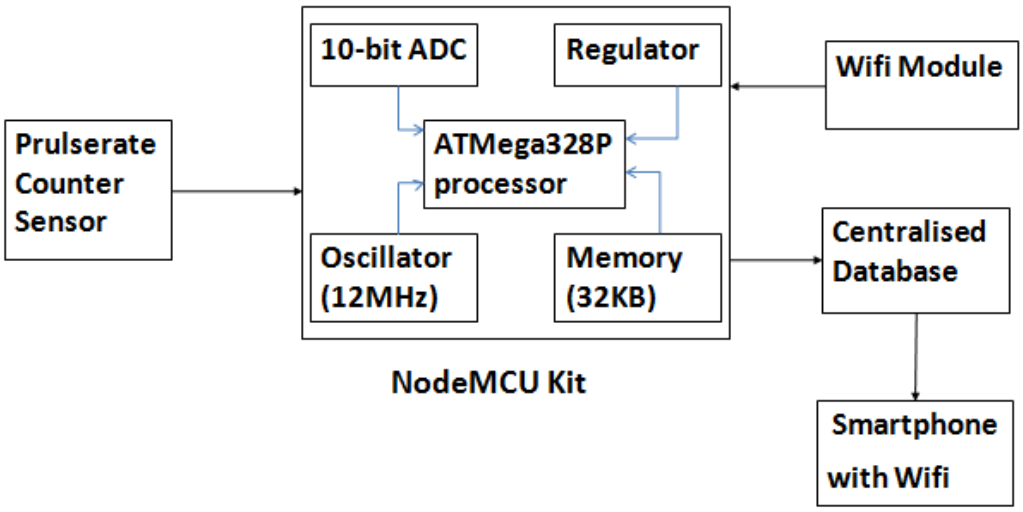
EXISTING SYSTEM :

In this System the researcher designed health monitoring system using ATmega8 microcontroller with Wireless Body Area Sensor Network (WBASN). In this work, the sensors which are used here are Temperature sensor, Blood pressure sensor, Heart beat sensor. These sensors are placed on human body which are helps to monitor the health condition without disturbing the daily schedule of the patient and these health related parameters are then forwarded to physician's server using long range wireless technology GSM. Health monitoring system consists of sensors, microcontroller, LCD display and GSM modem to transmit or receive health related data to or from the doctor. Similarly, at hospital same GSM modem is used. Hence, GSM modem helps in the establishment of network between patient's server and doctor's server. LCD(Liquid Crystal Display) display is providing to show the instant result to the patient. Here researcher used LM34 as temperature sensor, IR LED and red LED is used for heart rate monitoring and Pressure transducer or the sensor based on piezo-electrical material is used to measure the systolic BP and diastolic BP. Microcontroller reads data as given by the temperature sensor, blood pressure sensor and heart rate sensor and processing it gives the output in the form of digital and it gets directly display on LCD or it gets transmitted to the doctor's server through GSM modem. This system gives exact and instant result with high accuracy which gets directly display on LCD. It takes max 4-5 sec to monitor the doctor's server using GSM wireless technology .This system takes small amount of time to know the health condition of patient and then delivers the report to the doctor.

PROPOSED SYSTEM:

In past years, at remote rural areas the peoples die, due to lack of treatments and lack of availability of health monitoring devices and doctors, most of the countries in the world facing this type of problems. There are numbers of the system which can provide remote health care services but there have some limitation such as very costly, lack of patient data security and highly communicational and computational overhead. According to the World Health Organization, the probability of dying between 15 and 60 years of age in male/female (per 1000 population) in India is nearly 250/169. In present years, the chronic diseases and the civilization diseases are introduced in the world, due to the changes in the environment. In order to avoid existing problem, the proposed system introduced integrated health monitoring devices with low cost and take an advantages to continuously monitor patient physiological parameters.

Today's healthcare systems in most countries are struggling with increased number of patients and increased costs of patient care per patient. This situation is aggravated by the current trends of unhealthy lifestyle habits, including stress and physical inactivity, which increasingly leads to chronic illnesses such as obesity, diabetes and heart disease, even in younger population. For such cases, early treatment, including physical exercise, could prevent negative outcomes as population ages. Such a treatment would be more likely to succeed if the healthcare system had access to facilities for continuous monitoring of the individual's physical fitness level, because it would allow monitoring compliance and providing feedback. Such facilities would ideally consist of simple, inexpensive and readily available equipment.



V. RESULT:

After setting up the system, check all the connections. Once the system is ready upload the source code. After uploading the code place the index finger on the heartbeat sensor. The heartbeat sensor will start monitoring the pulse rate. LCD is used for displaying the calculated pulse rate. The system has configured maximum range of heart beat. Once the system starts measuring the Human heart beat, if it crosses the set limit then the system will send alert about heart rate. Also the system alerts for lower heart rate. The reading from sensor will be uploaded to server where data will be store. The readings will be refreshed consistently giving the extension for constant seeing of the patient.

VI. CONCLUSION:

In this exploration we have attempted to propose a total paper on detecting heart attack by monitoring the heartbeat of person. The heart beat sensor which is interfaced with microcontroller senses the heartbeat of person and transmits them over internet using Wi-Fi module. System allows setting limits of heart beat. After setting these limits person can start monitoring the heart beat and whenever the person's heart beat goes above certain set point they can get an alert on high heart beat and also about chances of heart attack. Also the system alerts
for lower heartbeat.

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