IMMEDIATE DISEASE DETECTION USING SMART HEALTH

[1]Rajeshwari Kisan , [2]Raheen Multani , [3]Priyanka Sapakal, [4]Reema Patil , [5]Saakshi Das

Abstract—By incorporating key technologies such as IoT and AI, medical services can be improved. The major goal of this project is to design a disease diagnosis model for heart disease and diabetes and also various medical problems(accidents) using AI and IoT convergence techniques. The presented model encompasses different stages namely, data acquisition, pre-processing, classification and parameter tuning. IoT devices such as wearables and sensors permit seamless data collection while AI techniques utilize the data in disease diagnosis

Keywords—IoT, Wi-Fi Module, Health Care, Medical Services, authorized, efficient.

I. INTRODUCTION

Artificial Intelligence is an approach to make a computer, a robot, or a product to think how smart human think. AI is a study of how human brain think, learn, decide and work, when it tries to solve problems. And finally, this study outputs intelligent software systems. The aim of AI is to improve computer functions which are related to human knowledge, for example, reasoning, learning, and problem-solving. The intelligence is intangible. It is composed of Reasoning, Learning, Problem Solving, Perception, Linguistic Intelligence. The objectives of AI research are reasoning, knowledge representation, planning, learning, natural language processing, realization, and ability to move and manipulate objects. There are long-term goals in the general intelligence sector. Approaches include statistical methods, computational intelligence, and traditional coding AI. During the AI research related to search and mathematical optimization, artificial neural networks and methods based on statistics, probability, and economics, we use many tools. Computer science attracts AI in the field of science, mathematics, psychology, linguistics, philosophy and so on. The Internet of Things (IoT) is a system of interrelated computing devices, mechanical and digital machines, objects, animals or people that are provided with unique identifiers and the ability to transfer data over a network without requiring human-to-human or human-to computer interaction." An IoT ecosystem consists of web-enabled smart devices that use embedded systems, such as processors, sensors and communication hardware, to collect, send and act on data they acquire from their environments. IOT devices share the sensor data they collect by connecting to an IOT gateway or other edge device where data is either sent to the cloud to be analyzed or analyzed locally. Sometimes, these devices communicate with other related devices and act on the information they get from one another. The devices do most of the work without human. In present day, people are suffering from various kinds of perform different types of functions within limits of specified time, accuracy and cost. This IoT base system is cheap and intervention, although people can interact with the devices -- for instance, to set them up, give them instructions or access the data

1.1 Introduction to Topic

Healthcare sector started leveraging information technology in the recent years to develop modern applications and enhance the diagnostic and treatment processes. The current research article presents a new AI and IoT convergence-based disease diagnosis model for smart healthcare system. Advanced medical services are comprised of several stakeholders such as doctors, patients, clinical and research centres and are required to monitor the patient regularly. From patients' viewpoint, wearable or portable devices can be applied for monitoring their health condition whenever required. The device is portable and affordable to everyone. There is no requirement of a nurse to monitor the patient regularly, since this work

could be done by the device. It can prevent the early unexpected deaths by knowing the symptoms and consulting the doctor and getting the treatment at the early stage. From the perception of doctors, smart

II.LITERATURE REVIEW

In this decade, IoT based system place the key role in medical appliances. For that reason, many researchers are trying to develop numerous IoT based medical appliances.

In this paper design of the wireless belt that continuously monitoring human pulse rate and temperature is proposed. It receives signal from body and send SMS to the doctor and their family member[1].

The implemented project described in this paper is a user-friendly, wearable and continuous monitoring system of blood pressure, heart rate, and body temperature, which can communicate with requested Android devices through Bluetooth. The system mainly consists of IR transmitter, receiver, LM-35, MPXV5050GP, the data acquisition unit, microcontroller (i.e., Arduino) and Bluetooth[2].

This project presents the implementation of PIC microcontroller based wireless architecture for human health monitoring system using the two sensors are used namely, temperature and pulse heart rate. The temperature sensor is used to continuously monitor the body temperature. The pulse heart rate sensor is used to measure the heart rate by sensing the change in blood volume in a finger artery while the heart is pumping the blood. The sensors output are given to the signal conditioning circuit to condition and amplify the sensors output and as a result of voltage value[3].

III.METHODOLOGY

Here, we used three sensors one is pulse rate sensor another one is body temperature sensor (LM35) and last one is Heartbeat sensor (ECG). These sensors signal are send to microcontroller. Arduino Mega is the main infrastructure, which was connected by Wi-Fi module.

A.System architecture

In this article, we describe about sensors which are essential, easy to use and has proper effectiveness. Here we considered three fundamental sensors, three for monitoring the vital signs of pulse, pressure sensor, and body temperature, all are recorded in a hospital environment.

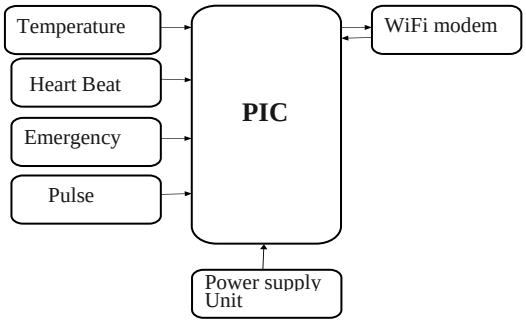


Fig. 1. Block diagram of proposed model.

B.Software Architecture

Software execution is one of the major part of this project, which is working as a brain of health monitoring system and maintain the user's flexibility. Microcontroller is the main infrastructure, where we put the data and got accordingly to the sensor value. The data is exerted by Arduino and sent to the ThingSpeak online software. The cloud storage is well developed server site which is very useful to store the real time data. Using the proper user ID, password and write API key the website takes the information and shows it to different fields of particular channel. This database is password protected, which is only give the authorized entry and secure the personal information of patient. The following step of the figure was taking for software development.

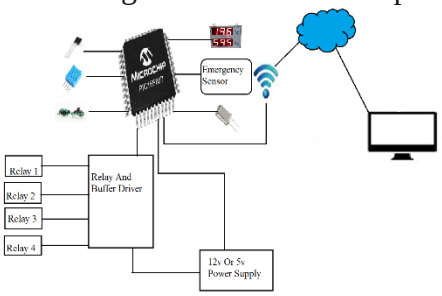


Fig. 2. Software architecture of remote health monitoring system

C.Hardware Implementation

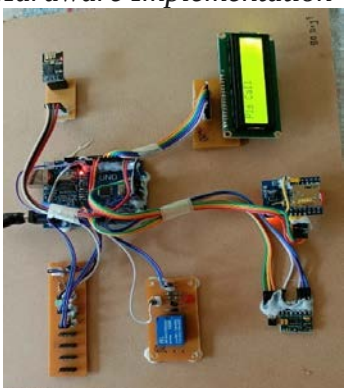


Fig. 3. Hardware setup

IV.RESULT ANALYSIS

A. Analysis Of Heart Rate On Arduino Uno.

In this figure, we obtained 121BPM heart rate from the patient, who was monitored and IBI of 1826ms. We collected the data from two mode of patient, one of the modes was relaxing mode and another one was excited mode. We got 80-90 BPM at the relaxing mode position and above 120BPM had found at exciting mode, which was consisting of anxiety, stress. So, the final value we get from the Pulse Sensor is shown below.

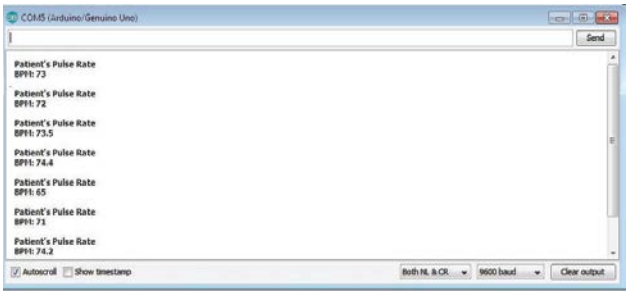
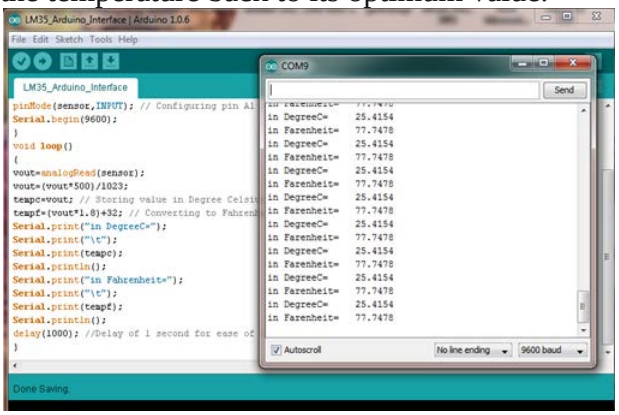


Fig. 4. BPM signal displayed in Arduino IDE serial plotter

B.Analysis of Body Temperature

The body temperature is one of the most vital parameters of a person's health. Any fluctuations in the boy temperature affects the functionality of the blood circulation hence the heart rate. The blood circulates through the body faster when the temperature rises to bring the temperature back to its optimum value.



Fluctuations while a patient was monitored. The representation of an increase in temperature of the body when the patient was physically stressed, the temperature of the surroundings is also a factor. When the patient stopped the physical activity and came to rest, the body temperature started to drop to its optimum value. So, it can be established that a significant increase in activity of the patient of due to other physical reasons or environmental reasons, the temperature of the body fluctuates accordingly and causes the heart to pump faster or slower for changing the blood circulation to bring back the temperature to its optimum value.

C. Real life outcome of this device

After connecting all the sensors to a patient, we run the module. To measure the values of Heart rate, Bodytemperature and ECG we ensure that all the sensor acquired.

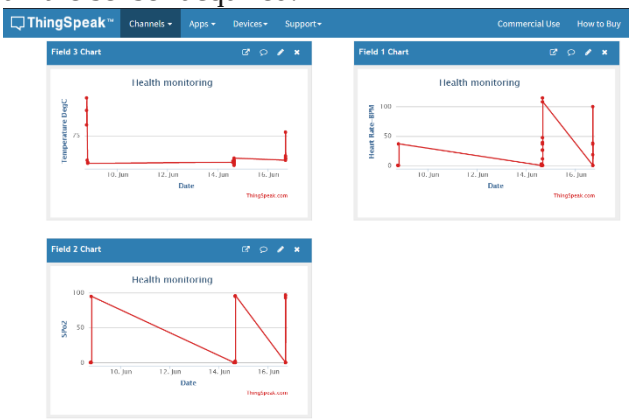


Fig.7.Health Monitoring condition in thing speak.

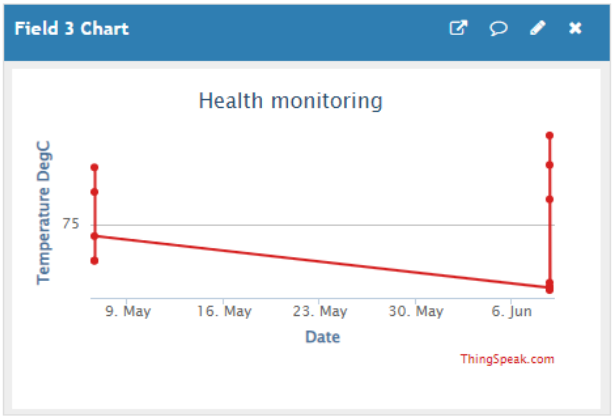


Fig.8.Temperature condition in thingspeak.

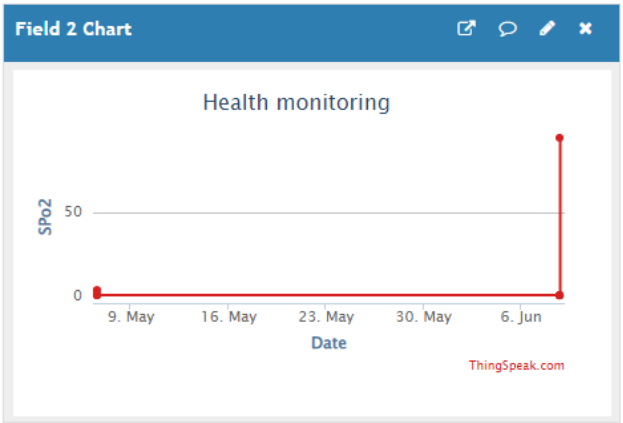


Fig.8.SPo2 condition in thingspeak.

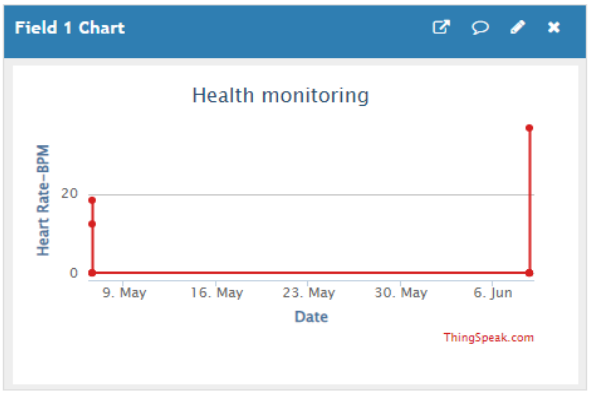


Fig.10.Heart Rate condition in thingspeak.

V. CONCLUSION

The proposed system provides an efficient, affordable, user friendly and portable healthmonitoring system. The data collected by sensors are stored securely in the cloud storage andthus, it can be easily accessible anywhere, anytime and by anyone who has access rights. Thesystem uses a controller, three and one emergency sensors and a cloud storage with all thecomponents connected to the internet. Which makes it easy to operate and less complex. Theuser can get vital signs check on a regular basis using this system which makes it one of thebestcompanions ofahealthy life.