

# Healthcare Monitoring System Using IoT

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**Abstract**— Monitoring and Recording of various medical parameters of user outside hospital has become widespread phenomenon. The reason behind this project is to design a system for monitoring the user body Temperature, Heartbeat Blood pressure and Electrocardiogram (ECG) by using sensors and the sensors will sense the body parameters of the user and send the values to IoT Cloud platform through Wi-Fi module. All information about the user health will be stored on the cloud, it enables the doctor to monitor user health, where the doctor can continuously monitor the user condition on his smart phone or computer and secure their lives by giving emergency alert in real-time. And doctor can also provide a diet plan to user as per his current health status.

**Keywords:** Healthcare Monitoring System, IoT, ECG

## I. INTRODUCTION

A remote health monitoring system is an extension of a hospital medical system where a patient's vital body state can be monitored. Traditionally the detection systems were only found in hospital and were characterized by huge and complex circuitry which required high power consumption. Continuous advances in the semiconductor technology industry have led to sensors and micro controllers that are smaller in size, faster in operation, low in power consumption and affordable in cost. This has further seen development in the remote monitoring of vital life signs of patients especially the elderly.

The remote health monitoring system can be applied in the following scenarios: 1. A patient is known to have a medical condition with unstable regulatory body system. This is in cases where a new drug is being introduced to a patient. 2. A patient is prone to heart attacks or may have suffered one before. The vitals may be monitoring to predict and alert in advance any indication of the body status. 3. Critical body organ situation. 4. The situation leading to the development of a risky life-threatening condition. This is for people at an advanced age and maybe having failing health conditions. 5. Athletes during training. To know which training regimes will produce better results. In recent times, several systems have come up to address the issue of remote health monitoring.

The system have a wireless detection systems that sends the sensor information wireless detection system that sends the sensor information wirelessly to a remote server, some even adopted a service model that requires one to pay a subscription fee. In developing countries this is a hindrance as some people cannot use them due.

## II. OVERALL DESCRIPTION

### A. Project Scope

Design a Health Monitoring System which has heartbeat detection system, temperature detection system, a humidity

detection system and heart ECG monitoring. Doctor or health specialist can use the system to monitor of all vital health parameters of the patient or person of interest.

### B. User Classes and Characteristics

IoT health monitoring has sensors. First one is a temperature sensor, second is heartbeat sensor and the third one is a electrocardiogram. This project is very useful since the user can monitor health parameters just by visiting our application and nowadays many IoT apps are also being developed. So now the doctors or family members can monitor system project, you need a Wi-Fi connection. The micro-controller or the arduino board connects to the Wi-Fi module. This Project will not work without a working Wi-Fi network. You can create a Wi-Fi zone using a Wi-Fi module or you can even create Wi-Fi zone using Hotspot on your Smartphone. The Arduino UNO board continuously reads input from these 3 sensors. Then it sends this data to the cloud.

### C. Operating Environment

Our Project is based on IoT platform. The Software Development Kit (SDK) is an open source python micro-controller software platform relied upon by tens of thousands of developers to build project fast. The embed compiler is a power online IDE that is free for use with Hardware Implementing the embed HDK, and tightly integrated with the embed SDK and Developer Website.

### D. Design and Implementation Constraints

Arduino UNO is a micro-controller board based on the ATmega328P. It has 14 digital input/output pins (of which 6 can be used as PWM output), 6 analog inputs, a 16 MHz quartz crystal, a USB connection, a power jack, an ICSP header and a reset button. It contains everything needed to support the micro-controller, simple connect it to a computer with a USB cable or Power it with a AC To DC adopter or battery to get started.

#### – Temperature Sensor

The most widely measured physical parameter is body temperature; it can be calculated by putting the sensor in contact with human body. The sensor used in this project is an LM35 temperature sensor. LM35 is a precision IC temperature sensor with its output proportional to the temperature (in  $^{\circ}\text{C}$ ). The LM35 sensor has more features that attracted us to choose it, such as Calibrated directly in Celsius (Centigrade), Linear + 10-mV/C scale factor; it measures temperatures from -55C to +150C range, the accuracy 0.5C



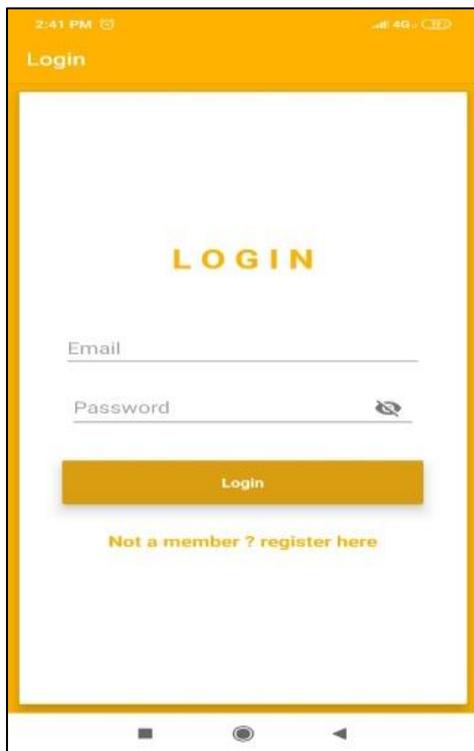


Figure 5: Login Page of Application

## 2) Main Windows form

This how the main window of this application looks like from where user can access all the features of the device.



Fig. 6: Main windows form

## V. NONFUNCTIONAL REQUIREMENTS

### A. Performance Requirements

The user will easily get the schedule of diet plan through android Smartphone. The system will make an announcement as per schedule entered.

### B. Security Requirements

Only the authorized user with credential scans able to insert an schedule and see the information on web page.

### C. Software Quality Attributes

- Reliability
- Availability
- Maintainability
- Portability

## VI. CONCLUSIONS

In this proposed system a mobile physiological monitoring system is presented, which is able to continuously monitor the patients heart beat, blood pressure and other critical parameters in the hospital. We proposed a continuous monitoring and control mechanism to monitor the patient condition and store the patient data's in server using Wi-Fi Module based wireless communication, we also proposed remote health care data acquisition and smart storage system. The work of the project is very essential in-order to make the design system more advanced. In the designed system the enhancement would be connecting more sensors to internet which measures various other health parameters and would be beneficial for patient monitoring i.e. connecting all the objects to internet for quick and easy access. Establishing a Wi-Fi mesh type network to increase in the communication range. In This report we have explained first module of this device and in the upcoming semester we will going to develop the existing system.

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