Cloud Based Medical Health Care System Using Internet Of Medical Things

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ABSTRACT

The healthcare monitoring systems has emerged as one of the most vital system and became technology oriented from the past decade. Humans are facing a problem of unexpected death due to various illness whichis because of lack of medical care to the patients at right time. The primary goal was to develop a reliable patient monitoring system using IoT so that the healthcare professionals can monitor their patients, who are either hospitalized or at home using an IoT based integrated healthcare system with the view of ensuring patients are cared for better. A mobile device based wireless healthcare monitoring system was developed which can provide real time online information about physiological conditions of a patient mainly consists of sensors, the data acquisition unit, microcontroller (i.e., Arduino), and programmed with a software (i.e., C).

The patient's temperature, heart beat rate, EEG data are monitored, displayed and stored by the system and sent to the doctor's mobile containing the application. Thus, IoT based patient monitoring system effectively monitor patient's health status and save life on time.

INTRODUCTION

IoT is used to integrate the data picking units like sensors, communication devices are connected to the internet. This arrangement is to make a network set up i.e., called as embedded network. It is additionally conceivable to get information or get data by communicating with sensors present in the external environment. The IoT devices could be classified in groups of smart sensors, user devices and gateways. The user data is provided with its own sensors that enable it to accumulate data and produce information. The Internet of things (IoT) describes physical objects (or groups of such objects) with sensors, processing ability, software, and other technologies that connect and exchange data with other devices and systems over the Internet or other communications networks. Internet of things has been considered a misnomer because devices do not need to be connected to the public internet, they only need to be connected to a network and be individually addressable.

A ESP32 microcontroller is employed in the proposed system to process data from the sensors. In this system consist of a DS18B20 Temperature sensor, AD8232 ECG sensor and Heartbeat sensor. The microcontroller takes data from the sensors, processes it, and then sends it to Thing Speak, where it is saved in spreadsheets for further analysis. When the patient's health exceeds its normal level, the google sheet will send a message directly to the

doctor or medical team, instructing them to monitor health. The 12 LCD display was utilized to display the current body temperature, heartbeat rate in real time.

According to the constitutions of World Health Organization (WHO) the highest attainable standard of health is a fundamental right for an individual. As we are truly inspired by this, we attempt to propose an innovative system that puts forward a smart patient health tracking system that uses sensors to track patient vital

parameters and uses internet to update the doctors so that they can help in case of any issues at the earliest preventing death rates.

Patient Health monitoring using IoT is a technology to enable monitoring of patients outside of conventional clinical settings (e.g. in the home), which may increase access to care and decrease healthcare delivery costs. This can significantly improve an individual's quality of life. It allows patients to maintain independence, prevent complications, and minimize personal costs. This system facilitates these goals by delivering care right to the home. In addition, patients and their family members feel comfort knowing that they are being monitored and will be supported if a problem arises.
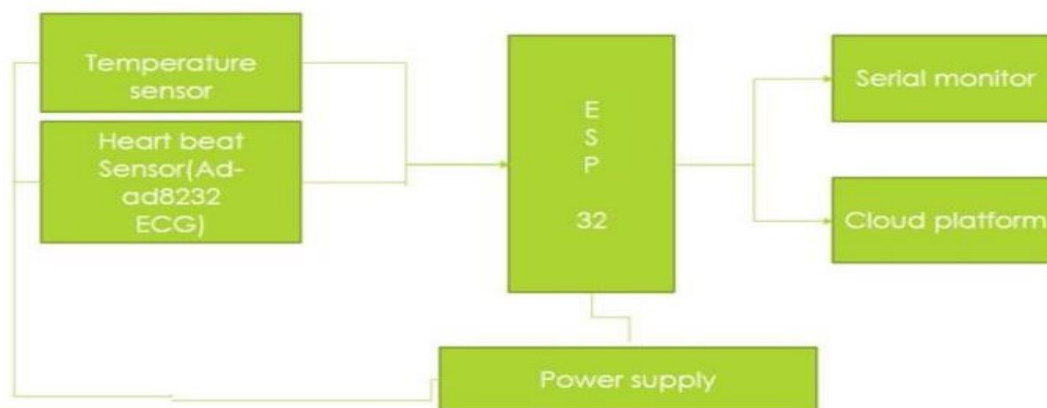
LITERATURE REVIEW

S. J. Jung and W. Y. Chung studied the Flexible and scalable patient's health monitoring system in 6LoWPAN . The main advantage of this enabling factor is the combination of some technologies and communications solution. The results of Internet of Things are synergetic activities gathered in various fields of knowledge like telecommunications, informatics and electronics.

K. S. Shin and M. J. Mao Kaiver studied a cell phone based health monitoring system with self analysis which incorporates IoT [13] a new paradigm that uses smart objects which are not only capable of collecting the information from the environment and interacting the physical world, but also to be interconnected with each other through internet to exchange data as well as information.

Gennaro tartarisco and Tabilo Paniclo had studied a Maintaining sensing coverage and connectivity in large sensor networks mainly includes the information about how to build or develop a new computational technology based on clinical decision support systems, information processing, wireless communication and also data mining kept in new premises in the field of personal health care.

Cristina Elena Turcua studied Health care applications a solution based on the Internet of Things survey aims to present a detailed information about how radio frequency identification, multi-agent and Internet of Things technologies can be used to develop and improve people's access to quality and health care services and to optimize the health care process.

PROPOSED SYSTEM

In the proposed system could gather, reading of various important indications of the patient and after that evaluate at cloud then caution the doctor or concerned individuals about the health condition. It monitors the Vital signs and sense abnormalities. These abnormalities alert the medical staff, it reduces the manual monitoring. The system uses MQTT communication to send the data to cloud platform. This message protocol transmits the readings of important patient's vital sense and helps a web interface to give a pictorial representation of information.

MODULE DESCRIPTION

The module split up for monitoring the health:

- Temperature sensor
- Heartbeat sensor
- ESP32

Temperature sensor:

The working principle of this DS18B20 temperature sensor is like a temperature sensor. The resolution of this sensor ranges from 9-bits to 12-bits. But the default resolution which is used to power-up is 12-bit. This sensor gets power within a low-power inactive condition. The temperature measurement, as well as conversion of A-D, can be done with a convert-T command. The resulting temperature information. The can be stored within the 2-byte register in the sensor, and after that, this sensor returns to its inactive state. If the sensor is power-driven by an exterior power supply, then the master can provide read time slots next to the Convert T command. The sensor will react by supplying 0 though the temperature change is in the improvement and reacts by supplying 1 though the temperature change is done.

Heartbeat sensor:

AD8232 electrodes placement AD8232 works on 3.3 volts [3]. The ECG sensor AD8232 supplies the ECG signal to the controller section. The system is based on ARM 7 controller which is used to acquire the ECG signals. Microcontroller acquires the ECG signals data and processing can be done using embedded C programming. Microcontroller sends the data serially to a single board computer called Raspberry Pi.

ESP32:

The ESP32 is way advanced compared to the ESP-12e. Among several features, the ESP32 packs a CPU core, a faster Wi-Fi, more GPIOs (especially increased analog pins that we all desired), supports Bluetooth 4.2 and Bluetooth low energy. The board also comes with touch-sensitive pins, alongside a built-in Hall Effect and temperature sensors.

CONCLUSION

The "**Cloud Based Medical Health Care System using Internet of Medical Things**", has been checked and implemented successfully. The proposed system could gather, reading of various important indications of the patient and after that evaluate at cloud then caution the doctor or concerned individuals about the health condition. It monitors the Vital signs and sense abnormalities. These abnormalities alert the medical staff, it reduces the manual monitoring. The system uses MQTT communication to send the data to cloud platform.

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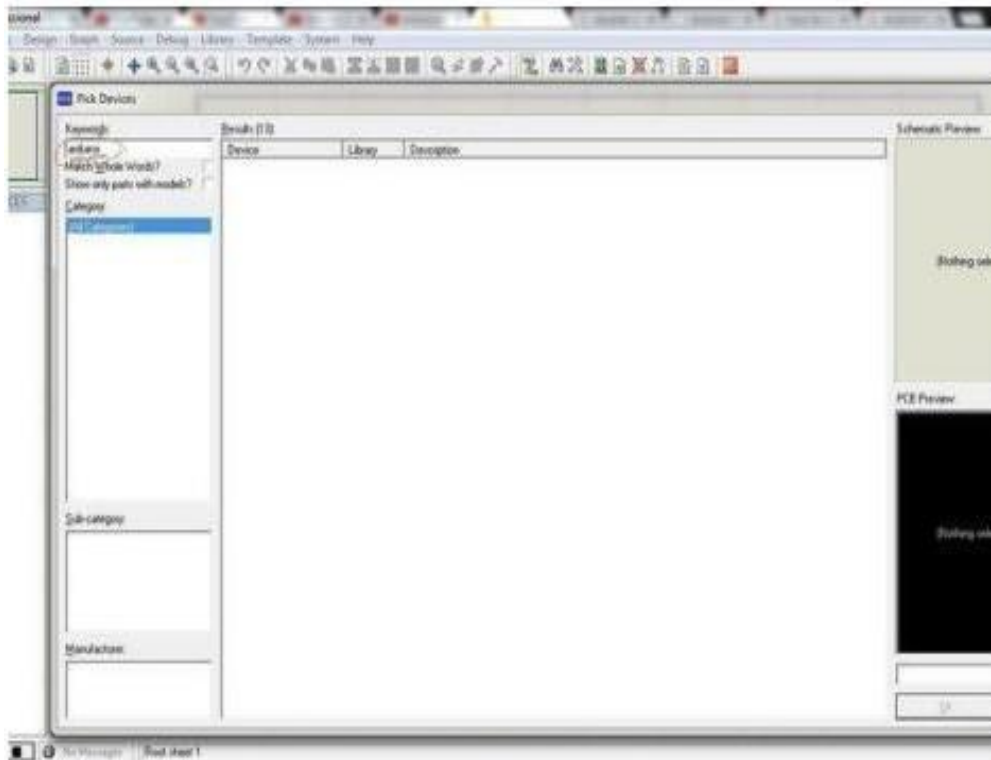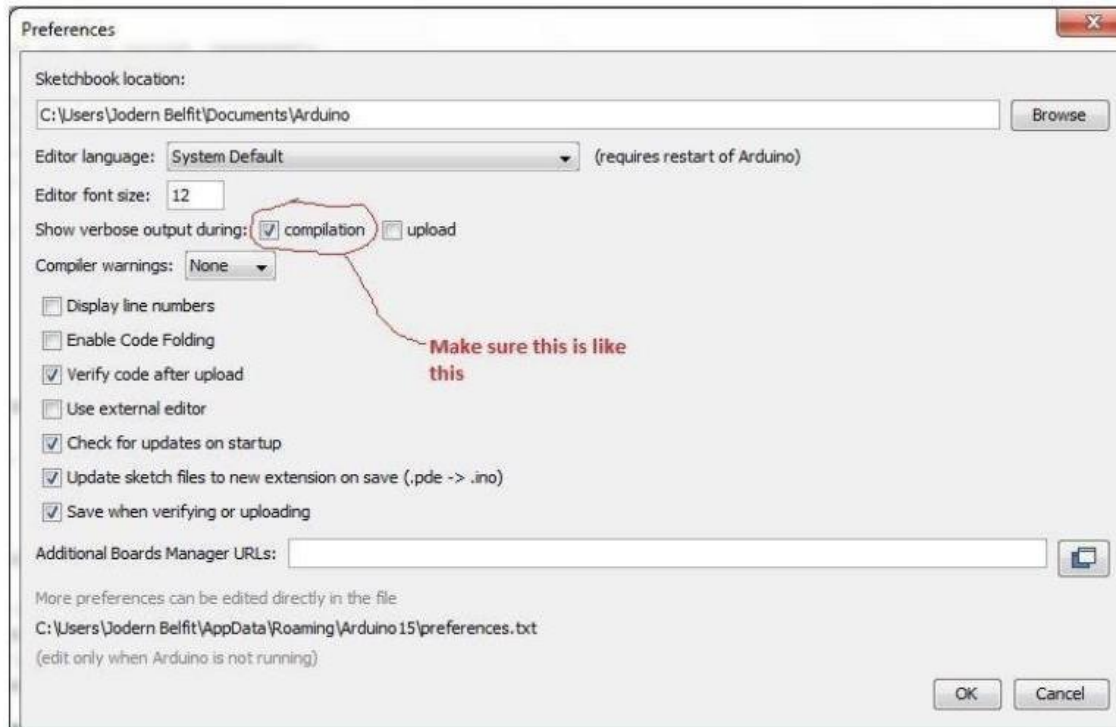
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