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A DESIGN OF INTELLIGENT WEARABLE HEALTH MONITORING SYSTEM BASED ON IOT

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ABSTRACT

A Major subject of concern in the medical field is to save lives of patient as soon as possible. Improper care, late detection, slow diagnosis and expensive machineries are reasons of most deaths of patients. Saving lives had become challenging work without the help of technologyAs a remedy to this we came up with a solution of patient health monitoring system which will keep track of various health components of patient. The system is very portable and can be manufactured at low cost. This system is capable to monitor heart beat and temperature of the body.

 The device will work on Internet of things technology. This device is implemented using ARDUINO UNO board with external Wi-Fi device such as ESP8266. And the device will be connected to WiFi, with help of which the data will be sent over to internet over to Blynk cloud platform. With which the data can be monitored from anywhere at any time.

INTRODUCTION

In recent years, the intersection of healthcare and technology has witnessed remarkable advancements, notably in the realm of wearable health monitoring systems. These systems, empowered by Internet of Things (IoT) technology, have revolutionized the way individuals monitor and manage their health in real-time. This document presents the design and significance of an intelligent wearable health monitoring system based on IoT, highlighting its importance and advancements over traditional monitoring methods. By continuously monitoring vital signs and other health parameters, these systems provide users and healthcare professionals with valuable insights into their well-being, enabling timely interventions and personalized healthcare solution.

The significance of wearable health monitoring systems extends beyond individual health management. These systems contribute to the advancement of population health by facilitating large-scale data collection and analysis.
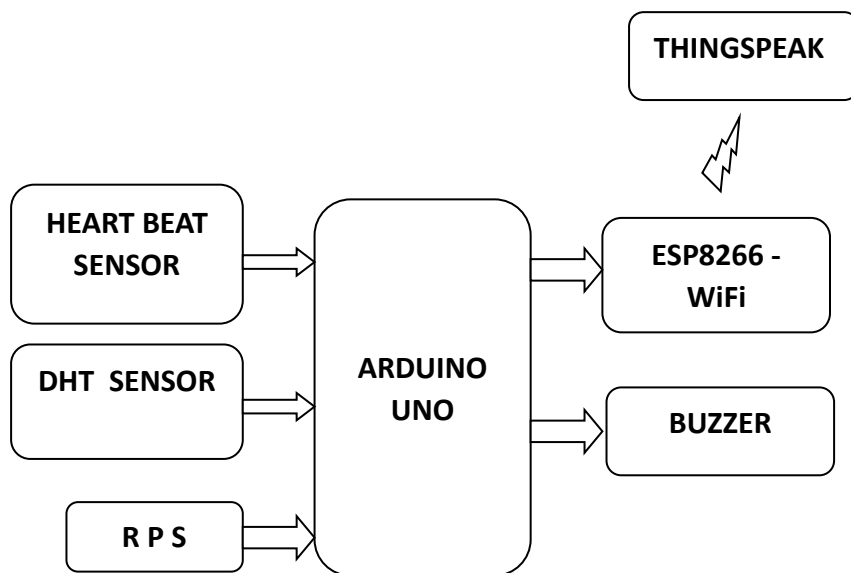

Figure.1 Block Diagram

OBJECTIVE OF THE PROJECT

Our project is a design of intelligent wearable health monitoring system and the primary goal of this project is to develop a smart patient health monitoring system in such a way that we can get all the necessary and detailed information of the disease. The proposed system measures the body temperature, pulse rate. Health is always a major concern in every growth the human race is advancing in terms of technology. Remote Patient Monitoring arrangement empowers observation of patients outside of customary clinical settings (e.g. at home), which expands access to human services offices at bring down expenses. The fundamental element of people's needs is health. Humans face a haul of surprising death and plenty of diseases because of varied diseases that are a result of lack of treatment to the patients at right time.. The main objective of this project is to develop a reliable sensible patient health observance system victimization IoT so the attention professionals will monitor their patients.

LITERATURE SURVEY

Review Academic Papers:

Look for academic papers published in journals and conferences related to biomedical engineering, health informatics, IoT in healthcare, and wearable technologies.

Focus on papers that discuss the design, development, evaluation, and clinical applications of wearable health monitoring systems based on IoT.

Pay attention to research on sensor technologies, data analytics, communication protocols, and integration with healthcare systems.

Explore Patents:

Search for patents related to intelligent wearable health monitoring systems and IoT in healthcare. Patent databases like Google Patents or the United States Patent and Trademark Office (USPTO) can provide insights into innovative technologies and solutions.

Look for patents related to wearable sensors, data processing algorithms, communication protocols, and medical device integration.

Check Technical Reports and Theses:

Technical reports and theses may contain detailed studies, experiments, and prototypes of wearable health monitoring systems based on IoT.

Search university repositories and medical research organizations' websites for theses and technical reports on IoT applications in healthcare.

Look for Review Articles and Book Chapters:

Review articles and book chapters can provide comprehensive summaries of existing research in wearable health monitoring and IoT in healthcare.

Look for literature reviews and survey papers that summarize the state-of-the-art technologies, challenges, and future directions in this field.

Search for Industry Publications and Whitepapers:

Industry publications, medical device manufacturers' websites, and whitepapers may contain case studies, best practices, and real-world implementations of wearable health monitoring systems.

Look for reports from healthcare technology companies, research organizations, and government health agencies.

PROPOSED SYSTEM

A design of Intelligent Wearable Health Monitoring System is our Proposed System

In our proposed system, we are using the Arduino Uno, Temperature Sensor, Pulse Sensor, Thingspeak IoT platform, wifi Module, Power supply. An Smart patient health Monitoring System will not only help in maintaining health but also reducing the work of doctors and saving the time of patients. The proposed method of patient monitoring system monitors patient's health parameters using Arduino Uno. After connecting internet to the Arduino uno, it is connected to cloud database system which acts as a server. Then the server automatically sends data to the receiver system.

Hence, it enables continuous monitoring of the patient's health parameters by the doctor. Any abrupt increase or decrease in these parameter values can be detected at the earliest and hence necessary medications can be implemented by the doctor immediately.

Various varieties of sensors are interfaced with the microcontroller Arduino Uno to create the system smart. The info will display in their webpage. The most ideal of the system is to transmit the knowledge through the webpage to continuous monitoring of the patient over the internet. Such a system would constantly detect the important body parameters like temperature, vital signs and would compare it against a predetermined range set and if these values cross the particular limit, it will immediately alert the doctor, during this system, a microcontroller is employed to transmit the info. The doctor will simply access the patients health anytime from anyplace. An BUZZER is additionally connected to the microcontroller for the for the patients alert .
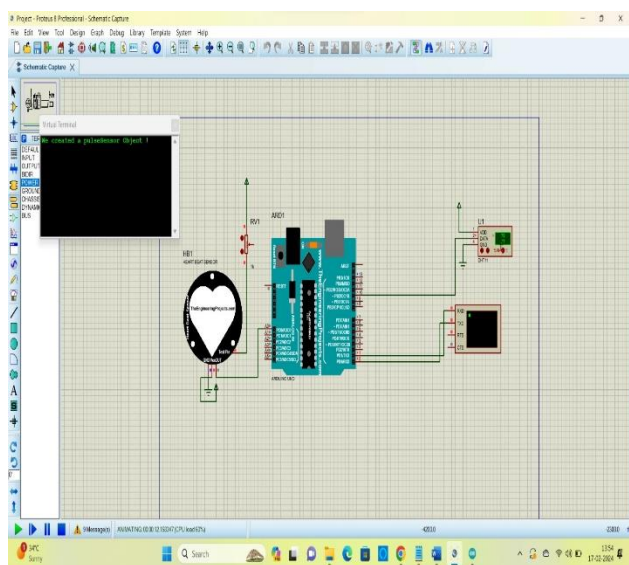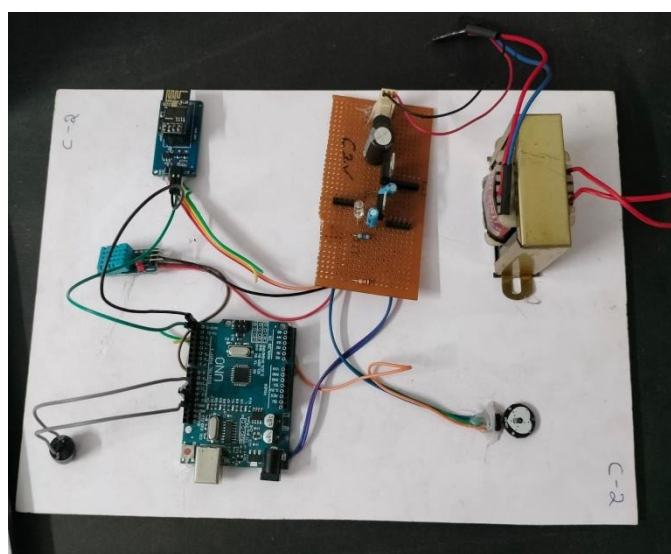

Figure.2 Schematic Diagram

Figure.3 Working Kit

ADVANTAGES

● Simple system to monitor the health parameters

● Response time is too good

● Immediately update in the IOT cloud web server

● Easy to implement

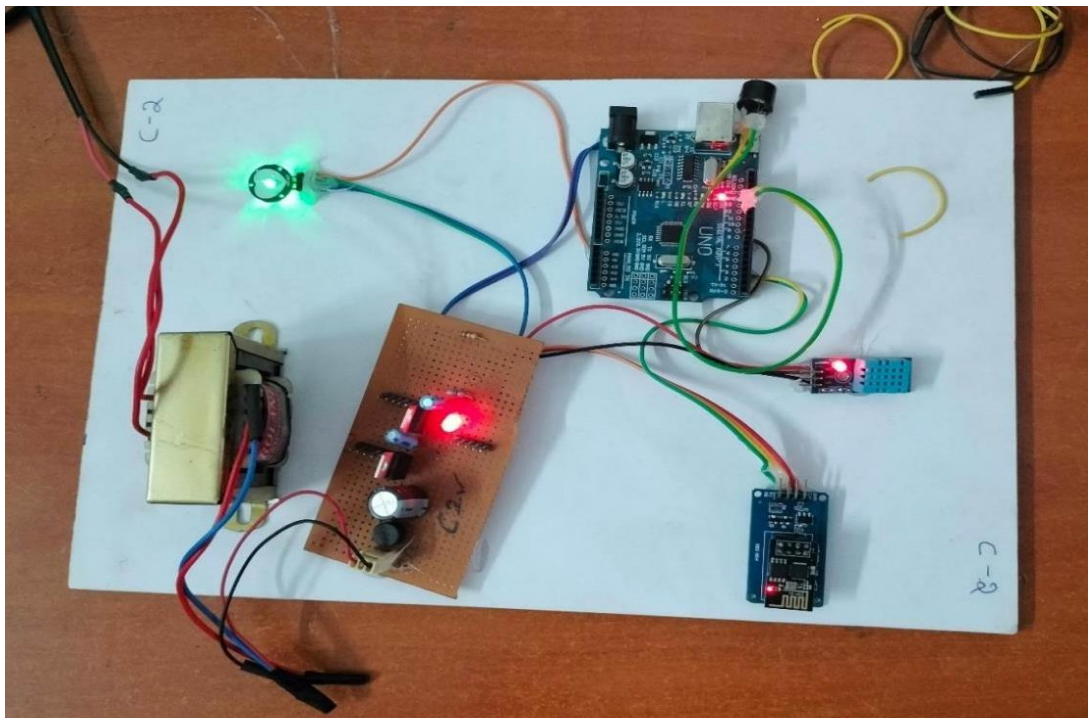● Cost effective system

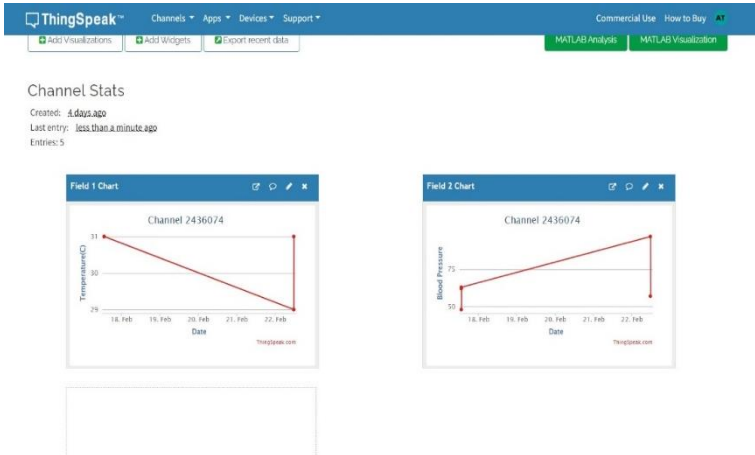## RESULTS

Figure.4 Project Setup
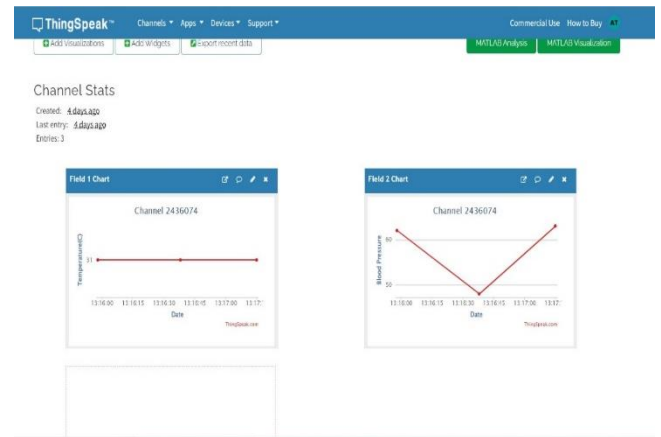

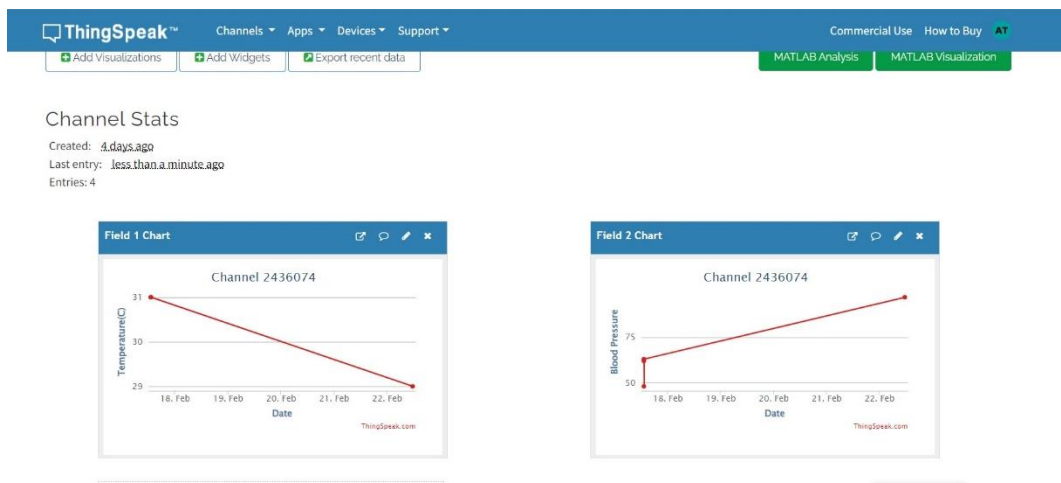Figure.5 Thingspeak result1   figure.5 Thingspeak result2

Figure.5 Thingspeak result3

CONCLUSION

The smart patient health care monitoring system developed by us has numerous applications. These types of healthcare systems can be implemented in hospitals as well as at home places where a person needs to have immediate medical attention whenever his/her health goes unstable**.** The Internet of Things is considered now as one of the feasible solutions for any remote value tracking especially in the field of health monitoring. It facilitates that the

individual prosperity parameter data is secured inside the cloud, stays in the hospital are reduced for conventional routine examinations and most important that the health can be monitored and disease diagnosed by any doctor at any distance. In this paper, an IoT based health monitoring system was developed. The system monitored body temperature, pulse rate and temperature using sensors, which are also displayed in ThingSpeak. These sensor values are then sent to a medical server using wireless communication. These data are then received in an authorized personals smart phone with IoT platform. With the values received the doctor then diagnose the disease and the state of health of the patient. The main objective of the experiment was successfully achieved. All the individual modules like Heartbeat detection module, fall detection module etc. and remote viewing module gave out the intended results. The designed system modules can further be optimized and produced to a final single circuit. More important fact that came up during project design is that all the circuit components used in the remote health detection system are available easily. The fundamental element of people's needs is health .Humans face a haul of surprising death and plenty of diseases because of varied diseases that are a result of lack of treatment to the patients at right time. The main objective of this project is to develop a reliable sensible patient health observance system victimization IoT so the attention professionals will monitor their patients. The sensors will be either worn or be embedded into the body of the patients, to unendingly monitor their health. The knowledge collected in such a fashion will behold on, analyzed, and well-mined to try and do the first prediction of diseases

FUTURE SCOPE

Integration of Advanced Sensors: Incorporating advanced sensor technologies such as biosensors, spectroscopy, and imaging sensors can enhance the capabilities of wearable health monitoring systems. Future designs may focus on miniaturization, increased accuracy, and multi-functionality of sensors to monitor a broader range of health parameters with higher precision.

Real-time Data Analytics and Machine Learning: Leveraging real-time data analytics and machine learning algorithms can enable intelligent analysis of health data collected by wearable devices. Future systems may utilize predictive analytics to detect and predict health conditions, anomalies, and disease progression, enabling early intervention and personalized healthcare management.

Enhanced Connectivity and Interoperability: Improving connectivity features and ensuring interoperability with other healthcare devices and systems will be crucial for future wearable health monitoring systems. Integration with electronic health records (EHRs), telemedicine platforms, and healthcare provider systems can facilitate seamless data exchange and collaboration for better patient care.

Remote Patient Monitoring and Telehealth: With the growing demand for remote healthcare services, wearable health monitoring systems can play a vital role in remote patient monitoring and telehealth. Future designs may focus on enhancing communication capabilities, enabling real-time remote consultations, and supporting virtual healthcare delivery models for improved access to healthcare services.

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