Arduino and IOT Based Patient Health Monitoring System

Sridam Garai[1], Nirban Roy[1], Tridip Nandi[1], Debarshi Maiti[1], Biswajit Biswas[1], Pritam Halder[1], Moumita Pal[2],

[1] Student, JIS College of Engineering, ECE Department, Kalyani, INDIA, 741235, [2], Assistant Professor, JIS College of Engineering, ECE Department, Kalyani, INDIA, 741235
Corresponding Author : Sridam Garai

ABSTRACT : The issue of health is the most important in our life, and more so during this Covid ridden years. This project was mainly for elder people where they can't go outside for a health check up or disabled people for whom it's hard to go outside for a checkup. But since covid hit it's hard for anyone to go outside for a medical checkup since going to a medical facility is more likely to cause someone getting infected by the virus .So this is our attempt to solve the problem for anyone who want to get their health checkup but can't go outside .With this project anyone can get their vitals checkup at their home and doctors or the user or their relatives can also monitor their vitals from anywhere in the worlds. In this project we are monitoring the various condition of the health of the patient using the IOT , where the different parameters of their health are sent to the cloud and stored there. This data can be seen by the doctor's , the user or the users relatives ,and can be used for suggestion or for reference which can be used for the treatment of the patient or used as a reference for other patients. All this can be done without exposing the patient to outside so they are less likely to get infected while getting their check up done properly. This can be immensely helpful these days it's safe reliable accurate and cheap.

KEYWORDS: IoT , Arduino , Remort Monitoring System .

INTRODUCTION

IoT based patient health monitoring system is a generic term given to any medical equipment that has internet capability and can measure one or more health data of a patient who is connected to the device such as heartbeat, body temperature, blood pressure, ECG, steps etc. The equipment can record, transmit and alert if there is any abrupt change in the patient's health.

For many years the standard way of measuring glucose levels, blood pressure levels and heart beat was with traditional exams in a specialized health centers. Due to the technological advances in today, there is great variety running sensor reading vital signs such as blood pressure cuff, glucometer, heart rate monitor, including electrocardiograms[2], which allow patients to take their vital signs daily. The readings which are taken daily are sent to doctors and they will recommend the medicine and workout routines that allow them to improve the quality of life and overcome such diseases.

In this project, we are monitoring various parameters of the patient using the internet of things. In the patient monitoring system based on the Internet of things project, the real-time parameters of a patient's health are sent to the cloud using Internet connectivity. These parameters are sent to a remote Internet location so that users can view these details from anywhere in the world.

HISTORYOF THE WORK : From the previous year We all are facing the major disease Covid19.As it is a pandemic there are shortage of hospital beds. In this time, we need a remote health check up access where we can save beds for critical patients. In this time, we basically use the SMS or message health check up system where we use gsm network system for the information regarding patient. This project will help for daily checking daily data of a patient about their health and continuous data for analysis purpose. In previous system doctor need to wait for the SMS for remote checking process but in this project, they can access the data from cloud by searching the cloud's URL. There will be daily record of patient's health. However this thing will help to reduce beds lacking for the critical patient in this pandemic situation.

METHODOLOGY :

Block Diagram of the IOT based health monitoring project:

Sensor is a device that converts signals from one energy domain to electrical domain. IOT based patient health monitoring has 3 sensors. The first one is a temperature sensor, the second is the Heartbeat sensor and the third one is a humidity sensor. A temperature sensor is an electronic device that measures the temperature of its environment and converts the input data into electronic data to record, monitor, or signal temperature changes. Heartbeat Sensor is an electronic device that is used to measure the heart rate i.e. speed of the heartbeat. A humidity sensor is an electronic device that measures the humidity in its environment and converts its findings into a corresponding electrical signal.

The Arduino UNO board which is a microcontroller board based on the ATmega328P, continuously reads input from these 3 senses.

Then the Arduino UNO sends this data to the cloud by Wi-Fi module and display the data in LCD display also. Here we have use ESP8266 as Wi-Fi module. It is a self-contained SOC with integrated TCP/IP protocol stack that can give any microcontroller access to your Wi-Fi network. A LED display is a flat panel display that uses an array of light-emitting diodes as pixels for a video display. Their brightness allows them to be used outdoors where they are visible in the sun for store signs and billboards. After a certain time the data willbe updated.

We also have a buzzer connect to Arduino UNO .If the data form the three sensors will reach a certain amount which is not sweetable for the patient then the buzzer gives us a sound.

OUTPUT : With our IOT based patient health monitoring system one can know about different important variables of their health like humidity, pressure, temperature , heart rate which can be sent to doctors or medical expert for treatment .
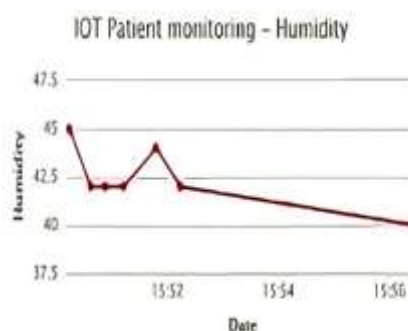Below is a graph of the output:

This is the graph of the patients heartbeat from itwe can monitor the patient's heart.
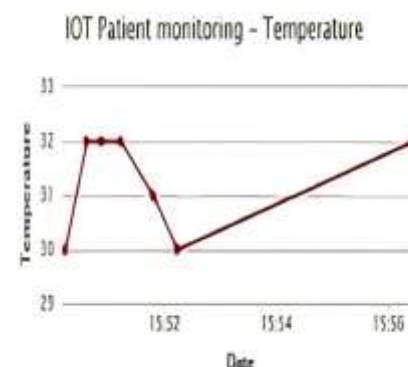
This is the patients temperature graph from here we can monitor the patients temperature.

This the patients humidity graph from here we can monitor the persons liquid level.
From these we can learn about most of the common health problems a person can have and which will be sent to a doctor for medications.

REFERENCES :

[1]. Aboul Ella Hassanien, Nilanjan Dey and Surekha BorraMedical Big Data and Internet of Medical Things: Advances, Challenges and Applications.

[2]. Chakraborty, C., Banerjee, A., Kolekar, M.H., Garg, L., Chakraborty, B. (Eds.), Internet of Things for Healthcare Technologies.

[3]. Wikipedia article Connected Health.

[4]. IOT based projects ,project of 8051.

[5]. Purnima, Puneet singh, "Zigbee and GSM based Patient Helath Monitoring System", IEEE International Conference on Electronics and Communication System, September 2014.