Health Monitoring System for Dementia Affected Patients Using RTC

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Abstract

With an improvement in technology and miniaturization of sensors, there have been attempts to utilize the new technology in various areas to improve the quality of human life. One main area of research that has seen an adoption of the technology is the healthcare sector. The people in need of healthcare services and it very expensive this is particularly true in developing countries. As a result, this project is an attempt to solve a healthcare problem currently society is facing. The main objective of the project is to create a health and security device for dementia affected patients with devices like heartbeat sensor, temperature sensor, etc. Technology plays the major role in healthcare system, not only for recording parameters through sensory devices but also in communicating, recording and storing the measured parameter. It is very important to monitor various medical parameters. To access the patient's medical parameters in local and remote area, healthcare communication using GPS and Real Time Clock (RTC) for alarm for medication method is adapted. The main objective of this project is to transmitting the patient's health monitoring parameters through wireless communication and also we can store these parameters into SD card due to lack network. These input data are stored in cloud server or into memory card and transmitted to the computer and mobile for caregivers and doctors.

Keywords: *ARM Lpc2148, Heartbeat Sensor, RTC, GPS, ThingSpeak.*

I. INTRODUCTION

The main objective of the project was to design a remote healthcare system for dementia affected patients. Dementia can go missing or experience critical incidents when they leave home alone and are unable to find their way back. The system comprises of two main parts. The first part being, detection of patient's vitals using sensors, second Remote viewing of the data enables a doctor or guardian to monitor patient's health progress away from hospital or home premises. The Real time clock concepts have been widely used to interconnect the available medical resources and other smart, reliable, and effective healthcare service to the patients. The health care monitoring system is very critical monitoring system, it is used for monitoring physiological signals including heart beat, body temperature etc. In health care monitoring system, the multiple sensors are used for receiving physiological signals like as including heart beat, body temperature probe to measure the physiological signal. For Dementia affected peoples there is also increased risk of injury or death from traffic accidents, hypothermia, dehydration, falls, fractures, and drowning.GPS module which can detect the person's location both inside as well as outside

of building send the location to the computer. Cardiac arrest is quoted as the major contributor to the sudden and unexpected death rate in the modern stress filled lifestyle around the surrounded. Sometime peoples go in critical condition means they feel discomforts, weakness and when patient goes to doctor then they become normal so doctor cannot diagnose the actual problem of patient about their abnormal conditions. The physicians cannot stay next to the patient all time round the clock, we go for the health monitoring system. Patient need to take efforts to get admission and stay long time in hospital for treatment.

To overcome many health problems, we are proposing change in technology by designing a device such that compromise of different sensors to acquire information regarding human body temperature, heart rate, save to database. To record abnormal conditions of human being using existing wireless technology. To monitor and alert about abnormal condition of human being to their caregivers and doctors. Remote health monitoring can provide useful physiological information in the home. Wireless sensors are used to collect and transmit signals of interest and a processor is programmed to receive and automatically analyze the sensor signals. In this project, we are to choose appropriate sensors according to what you would like to detect and design algorithms to realize your detection. The system was to collect a heartbeat detection system data, temperature data. In today's fast-moving world, where all are trying to move towards technology-based system in all day to day life activities there is also need of smart system which will save the humans life with automation facility in it like all other thing around us now a day's which are mostly automated. The physicians cannot stay next to the patient all time round the clock, so we go for the health monitoring system to record abnormal conditions of patients. When patient's heartbeats and temperature become abnormal then our system will record the abnormal values of the person by using sensors such as heartbeat sensor. For such purpose we are trying to build this system.

II. LITERATURE SURVEY

The proposed system here consists of various medical device such as sensors and web based or mobile based application which communicate via network connected devices and help to monitor and record patient health data and medical information .The objective of this paper is to transmitting the patient's health monitoring parameter through wireless communication[1].
The primary goal was to develop a reliable patient monitoring system using IOT so that the healthcare professionals can monitor their patient, who are either hospitalized or at home using an IOT based integrated healthcare system with the view of ensuring patient are cared for better[2].
The objective of the proposed work is to design a hardware which would constantly monitor the health parameter such as pulse rate, oxygen content, temperature, sweating, blood pressure and falling of patients [3].
This system is developed for human physical activity assessment in ambulatory monitoring using only one portable sensing device combining tri- axial accelerometer and its distributed data processing [4].
In this system, it presents an accelerometer sensor-based approach for human activity recognition. Our proposed recognition method uses a hierarchical scheme [5].
In this system they implemented a small- size wearable data storing system in real time that they used Micro Sd-Memory card for convenient and long period habitual physical activity monitoring during daily life [6].
Activity recognition based on sensory data in AAL systems is an important task because: it can be

used for estimation of levels of physical activity; can lead to detecting changes of daily patterns that may indicate an emerging medical condition, or can be used for detection of accidents and emergencies. To be accepted, AAL systems need to be affordable while providing reliable performance [7].

III. PROPOSED SYSTEM

The proposed system is to design a real time health and security monitoring device for dementia affected elders. It consists of web server, thingspeak and sensors like heart beat and temperature sensor. The sensor will get information from the controller and it will pass that information over a network, that values will be accepted by the server and it can be used to view over thingspeak which is in the network. The network used is WLAN.
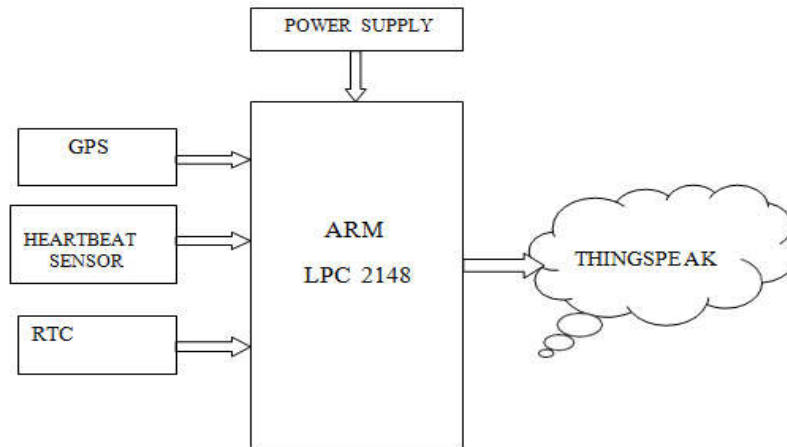
Fig.1 : *Block Diagram*

A.Hardware

ARM LPC2148: The controller used in the system is the LPC2148 ARM processor. The LPC2148 is a 32 bit ARM7 family based micro-controller and it works on maximum 60Mhz. Low power RTC (real time clock) The LPC2148 micro-controller has two input/output ports and these are termed as P0 &P1each of 32 bits.

GPS: Wandering is a common behavior in people with dementia, but cognitive impairment can cause them to become disoriented and lost. Locator devices that use GPS (global positioning system) are assistive technologies that can help to promote safe walking by alerting caregivers when a person with dementia wanders outside of a designated area, and providing the geographic coordinates of that person so they can be found more easily.The recorded location data can be stored and transmitted. It essentially contains a GPS module that

receives and calculates the coordinates. The GPS system locate the coordinates and further sends to the ARM LPC2148 and this data is further send to the thingspeak where we can locate the patient with the help of maps. This location we can view on any device like mobile phones, computer etc.

Heartbeat Sensor: Heartbeat Sensor is an electronic device that is used to measure the heart rate i.e. speed of the heartbeat. Monitoring body temperature, heart rate and blood pressure. The principle behind the working of the Heartbeat Sensor is Photoplethysmo graph. According to this principle, the changes in the volume of blood in an organ is measured by the changes in the intensity of the light passing through that organ. Usually, the source of light in a heartbeat sensor would be an IR LED and the detector would be any Photo Detector like a Photo Diode, an LDR (Light Dependent Resistor) or a Photo Transistor.

Fig.2 : *Heartbeat Sensor*

B.Software

Thingspeak:- ThingSpeak is an open source internet of things (IoT) application to store and retrieve data from things using the HTTP protocol over the Internet or via a Local Area Network. ThingSpeak enables the creation of sensor logging applications, location tracking applications, and a social network of things with status updates. ThingSpeak was originally launched by ioBridge in 2010 as a service in support of IoT applications. ThingSpeak has integrated support from the numerical computing software MATLAB from MathWorks allowing ThingSpeak users to analyze and visualize uploaded data using Matlab without requiring the purchase of a Matlab license from Mathworks.
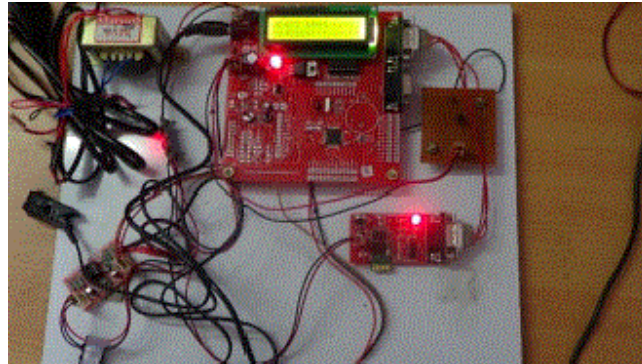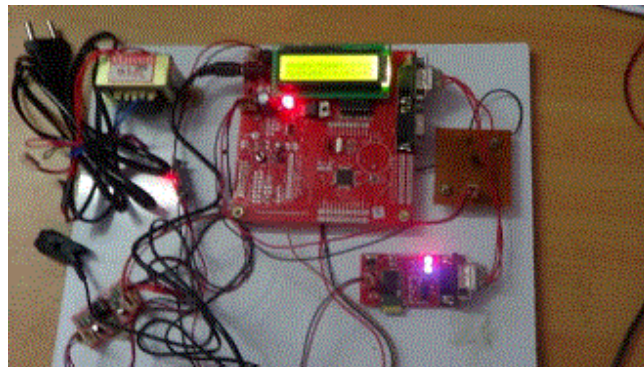
VI.EXPERIMENTAL RESULTS

Fig.3 Output 1

Fig.4 Output 2

IV. CONCLUSION

In today's fast-moving world, where all are trying to move towards technology-based system in all day to day life activities there is also need of smart system which will save the humans life with automation facility in it like all other thing around us now a day's which are mostly automated. In system patient health monitoring are done by different sensors & transmitted the data towards the network using thinkspeak .Our system can be highly used in emergency situations as it can be daily monitored, recorded and stored as a database. In future our device can be combined with the cloud computing so that the database can be shared in all the hospitals for the intensive care and treatment. Our system concludes that physicians cannot stay next to the patient all time round the clock, we go for the health monitoring system. It records the abnormal values like heartbeat, temperature of the person by using various sensors such as heartbeat sensor, temperature sensor, etc.

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