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Iot Based Patient Health Condition Monitoring

Kaveya.S[1], Natarajan.S[2],Sudhersun.S[3],Santhosh.D[4],Venkatesh.R[5]

[1, 3, 4&5]*Department of ECE,K. Ramakrishnan College of Engineering, Trichy, Tamilnadu, India*

[2]*Department of Computer Science & Application, Muthayammal Memorial College of Arts and Science, Kakaveri,Tamilnadu,India*

[1]kaveyas@gmail.com

[2]sendmail2natarajan@gmail.com

[3]sudhersenkavi@gmail.com

[4]santhoshdhanush2532002@gmail.com

[5]venkysrt1546385@gmail.com

***Abstract*—**A few days now IOT plays a major in medical field. Most of the Smart city related projects were deals with smart homes, intelligent transportations, and patient monitoring system under the single concept called IOT. The main objective of this paper is to design and implement of real- time patient health monitoring alarm, especially in the case of patients suffering from sleep during their normal life. In this paper, advanced techniques and services, such as EDM, DS, and NS at the edge of the network were used for monitoring.

***Keywords*-**Internet Of Things (IOT); Embedded Data Mining (EDM); Distributed Storage (DS); Network Service (NS)

I. Introduction

Remote Healthcare has plays a critical role in elderly people lives. By providing wearable devices that are low power and secure, life for many elderly and physically disabled individuals has been enhanced. A promising technology to achieve is provided by this platform. The above mentioned healthcare programmes have been accomplished by the use of Internet of Things (IoT) and that can strengthen the health care systems

A helmet with integrated sensors will provide optimum comfort for sports such as walking, motor-racing, or military participation. The feasibility of monitoring the electrocardiogram (ECG), respiration, and EEG from face-lead positions was explored by embedding several electrodes inside a regular helmet. [1] Rules for scoring respiratory events in sleep: Update of the 2007 AASM manual for the scoring of sleep and associated events: Deliberations of the sleep apnea definitions task force of the American Academy of Sleep Medicine. The electrode locations are at the lower lip, mastoid, and forehead, while a respiration belt around the thorax and a reference ECG from the chest act as ground reality to measure the performance for confirmation purposes. [2]Now a day, more number of people suffers from sleep disorders. The sleep disorders is diagnosed by using Polysomnography

(PSG) in hospitals or sleep centers because it continuously and simultaneously records multiple physiological signals during sleep.[3]In this paper, breath in anomalies were detected by using time automated infrared video monitoring technique , In the diagnosis of obstructive sleep apnea, and its application. A new self-adaptive 3-D unsupervised breathing template to study the natural breathing habits of individuals online and to recognize irregular breathing behaviors and limb movements.

[4] Using a low-power ultra-wideband (UWB) impulse radio signal, the simultaneous recording of the chest respiratory rate and human amplitude is studied. [5], Sleep consistency is a major predictor of health and well-being. In the field of in-home sleep tracking, new advances have the potential to change the sleeping environment of a person and lead to an overall sense of well-being. In the field of in-home sleep tracking, new advances have the potential to change the sleeping environment of a person and lead to an overall sense of well-being. [10] RF and WSN technology also used to transfer the patients details through cloud during emergency purpose.

[6] Exploitation of continuous-wave modulated linear frequency (LFMCW) radars for non-contact respiration spectrum recording. In the addressed biomedical case, the hardware versatility and accuracy of monitoring were mixed, thereby outperforming other remote-sensing methods. [7] 94-GHz millimeter-wave interference, a human subject's pulse rate and respiration patterns can be obtained through constant motion signal of the wave chest wall. These components in the received signal have to be isolated from each other. After extracting the mean of both, quadrature and in-phase signal components were used to locate the phase, unwrap it, and transform it to a displacement measurement. [8] Evaluating innovative in-ear pulse oximetry for unobtrusive cardiovascular and pulmonary monitoring during sleep also developed for monitoring patients health.[9] Control of Single Phase Z-Source Inverter Fed Induction Motor Using Simple Boost Controlleris used to monitor the patient’s condition from remote area.

II. EXISTING SYSTEM

In the treatment of critically ill patients, the essential functions included respiratory rate, heart rate and rhythm, concentration of blood oxygen, blood pressure, and many other parameters. For reliable and immediate decision-making, electronic monitors are commonly used to gather and view physiological data, which is crucial for effective patient care. In order to diagnose unforeseen life-threatening illnesses, Non-invasive instruments in the medical-surgical wards of a hospital are used to collect data from less seriously ill patients, retirement homes, delivery suites, or homes occupied by patients. Routine-effective data was needed. Repeated or continuing observations or examinations of the patient, his or her body condition and life-support equipment condition are generally referred to as patient observation for the purpose of directing management actions, including whether or not to conduct clinical treatments and the assessment of such treatments

III. DESIGN METHODOLOGY

The IoT-based patient health management index is proposed. Their wellbeing can be taken care of by using this surveillance device. Through this system, by providing suitable medication, one can save lives. In order to detect body temperature, fracture bone moment, pain position and sleep position, breathing sensor and temperature sensor, flex sensor, motion sensor and gyro sensor are interconnected with the controller here. In every case, for the reason of alerting the

neighbour, an emergency buzzer is triggered. In addition, the parameters tracked are modified on the IoT. For the display of tracked parameters, this device uses an LCD. Here, the Arduino super controller is used to control the overall system.

Internet of Things (IoT) principles, which have become commonly used to interconnect the medical services available, are efficiently taken care of by patients. By delivering proper medicine at the right time without any hesitation, the patient's lifestyle will be strengthened. The key goal of the paper was to produce a sleep tracking device that would have to use locally available sensors in order to make it affordable if commercial production were to take place. The sensor data are then gathered via the Arduinomicrocontroller and relayed to the server where it is further stored and analyzed for remote viewing through this suggested design.

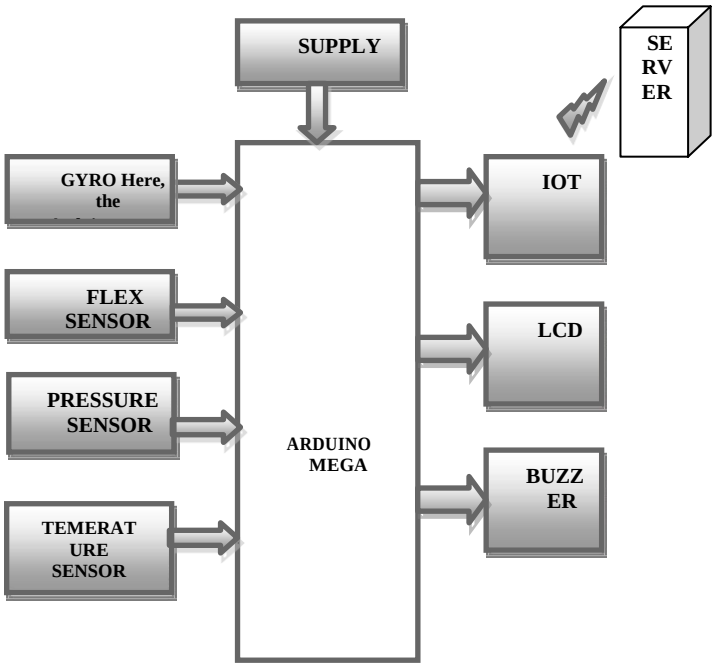

Figure 1: ARDUINO Block Diagram

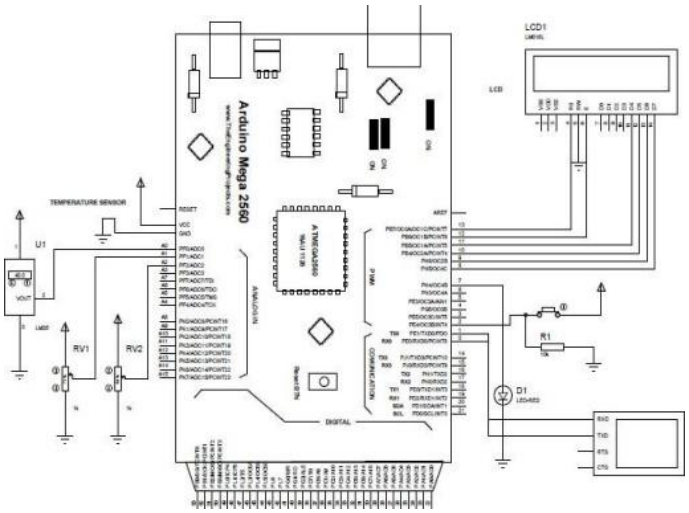

Figure 2: ARDUINO Circuit Diagram

A)PRESSURE SENSOR

In such diverse sciences as thermodynamics, aerodynamics, acoustics, fluid mechanics, soil mechanics and biophysics, pressure plays a major role. But in the medical industry, it acts as a transmitter to preserve a human being's health.

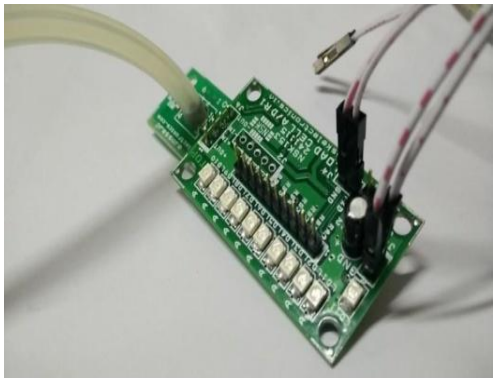

FIGURE 3: PRESSURE SENSOR

B)DC MOTOR

An electric DC engine is a system that transforms mechanical energy into electric energy. The DC motor operation is based on the idea that a mechanical force is encountered when a current-carrying conductor is put in a magnetic field. Fleming's Left-hand Rule gives the direction of mechanical force and its magnitude is given by F= BIl Newton.

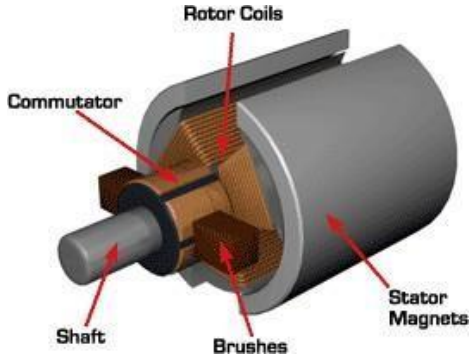

Figure 4: DC Motor

In the design of a DC generator and a DC engine, there is no essential distinction. As a matter of fact, the same D.C. As a generator or as an engine, computers may be used interchangeably. Like generators DC motors are also classified in to shunt-wound, series-wound and compound- wound. DC motors are also categorized into shunt-wound, series-wound and compound-wound, including generators. A wire coil with a current flowing through it creates an electric field associated with the coil 's core. With the path and magnitude of the current flowing through it, the path and degree of the magnetic field generated by the coil may be altered.

C) GPS

GPS stands for Global Positioning System which was developed as a worldwide navigation which positioning facility for both military and civilian use by the US Department of Defence. It is a radio-navigation space-based system which consists of 24 satellites and ground support. GPS offers users detailed knowledge about their direction and speed, as well as time, everywhere in the world and in all weather conditions.

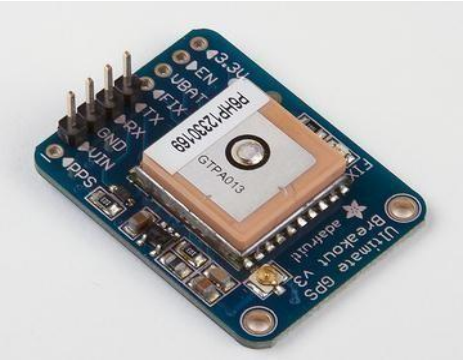

Figure 5: Global Positioning System

D). LATITUDE AND LONGITUDE

Latitude and longitude are angles on a sphere that uniquely identify points. Together, the angles shape a synchronization device that can identify spatial positions on planetary surfaces such as the Earth or define them. Latitude is defined with regard to the equatorial reference plane. This plane travels through the middle C of the sphere, which also includes the great circle marking the equator. The latitude of point P on the surface is defined as the angle with respect to the equatorial plane that a straight line, passing through both P and C, subtends.

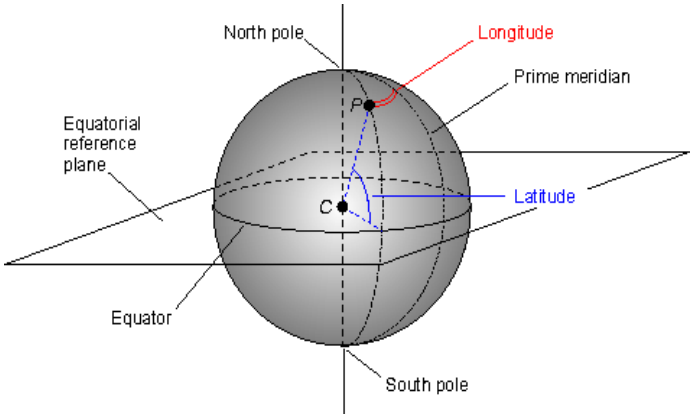

Figure 6: Direction of Tracking

Longitude is defined in terms of meridians, which are half-circles which run from pole to pole. A reference meridian, known as the prime meridian, is selected and this forms the reference by which longitudes are determined.

E) GSM

GSM is a mobile communication modem and stands for the Global Mobile Communication System (GSM) system. In 1970, at Bell Laboratories, the concept of GSM was born. In the world, mobile communication devices are commonly used. In the frequency ranges of 850MHz, 900MHz, 1800MHz and 1900MHz, GSM is a free, wireless cellular technology used for the transfer of data and mobile voice services.

Using the time division multiple access (TDMA) technique, the GSM approach was developed for communication purposes as a digital device. A GSM digitizes and decreases the data, then sends it down, each in its own unique time slot, through a channel of two separate client data sources. The digital system is capable of carrying a data rate of 64 kbps to 120 Mbps.

Figure 7: GSM Modem

A).GSM BLOCK DIAGRAM

The following components make up a GSM network:

a) A Mobile Station: A cell phone that is powered by a network-operated SIM card and which consists of a transceiver, a monitor and a processor.
b) Subsystem of Base Station: It serves as an intermediary between the mobile station and the network's subsystem. It contains Base Transceiver Station which includes the radio transceivers and manages the protocols for mobile communication. It also consists of the Base Station Controller that controls and serves as an interface between the mobile station and the mobile switching centre for the Base Transceiver station.
c) Network Subsystem: Offers a simple link to the cell network stations. The Mobile Service Switching Centre, which provides access to various networks such as ISDN, PSTN, etc., is the basic part of the Network Subsystem. It also consists of the Registry of Home Locations and the Registry of Tourist Locations. GSM Strengths, the Equipment Identity

also requires it. A registry that holds an account of all mobile objects listed on each mobile by their own IMEI number. IMEI stands for International Mobile Equipment Identity.

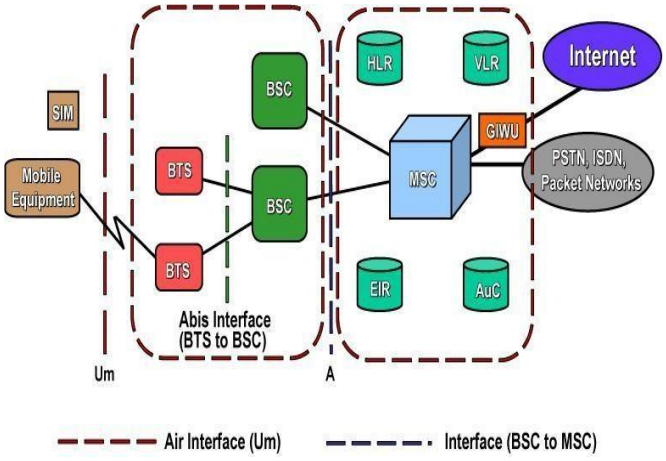

Figure 8: GSM Flow

F) ALCOHOLSENSOR

Ethanol with a faint chemical odour is a volatile, flammable, colourless oil. It is used as a disinfectant, a pesticide, a gasoline, and is the active fluid in many alcohol thermometers because of its low freezing point. The molecule, being an ethyl group connected to a hydroxyl group, is a basic one. Alcohol Sensor for the detection of the presence of alcohol gases in the Breathalyzer or in an alarm unit Combined with a fast response time, this sensor unit offers very high sensitivity. The unit works with a simple drive circuit and, with a long life, provides excellent stability. The instrument is able to evaluate another sample after all the acetic acid is cleared out of the FUEL CELL. On May 13, 1954, it was licensed as a trademark, although many people use the term to refer to any standardized blood alcohol content estimating unit. This Grove implements all the MQ303A circuits required, such as power conditioning and power supply for the heater. This sensor emits a voltage that is inversely proportional to the concentration of alcohol in the air.

Figure 9: Alcohol Sensor

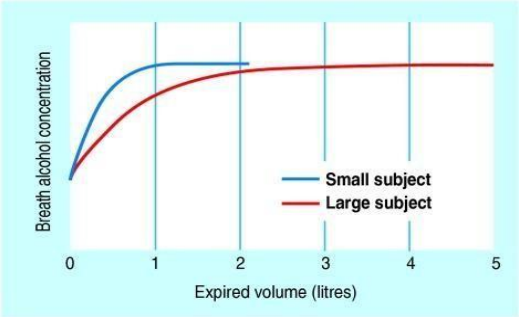

Figure 10: Range of Consumption

The highest dose of alcohol which can be reliably measured by evidence-based breath testers is 220 µg / 100 ml of air. The entire process takes 10 to 15 minutes for the fuel cell-based instrument and up to 5 minutes for the solely infrared-based one.

IV. RESULT AND CONCLUSION

It can reliably detect abnormal breathing episodes with only one off-the-shelf infrared camera, avoiding the need to invent advanced sensors and better target them at the necessary locations on the subject 's body to effectively design the device's safe and proper activity. There is no prerequisite for physical interaction between the sensor and the subject. This system is stable during sleep for the subject's unconscious gestures, and this can be deployed in a daily home setting.

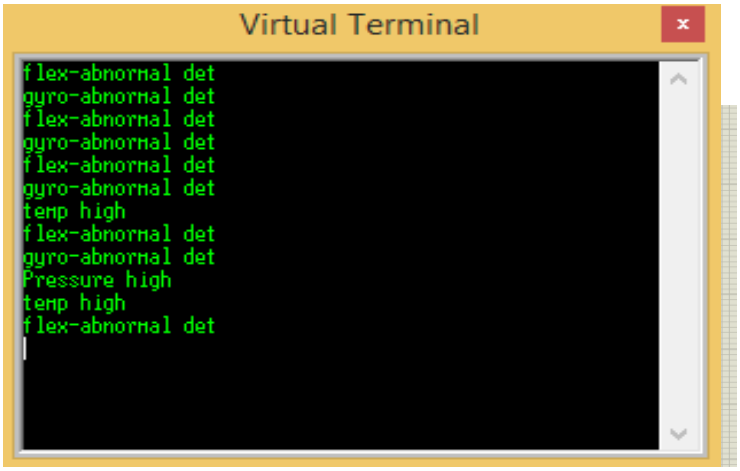

Figure 11: Output in Virtual Terminal

In addition, because of its quiet and non-contact manner of activity when sleeping, the monitoring device does not interrupt the subject.The patient is able to sleep peacefully because of this.We reached 93.3 percent by using this system in the simulation data set to understand hyperventilation events.

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