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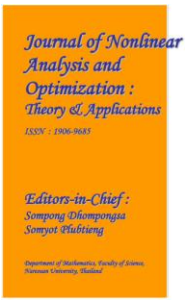

IOT ALCOHOL AND HEALTH MONITORING SYSTEM

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Abstract:

Factories, Offices, Hospitals, Military and other such industries need to monitor their staff/personnel follow all work ethics that include, not coming to premises under the influence of alcohol or under bad health conditions. This ensures proper work ethics are followed. So our proposed system allows for alcohol & health monitoring plus reporting system that monitors this and reports it to concerned personnel remotely over internet. Our system consists of an IOT based circuit system that uses a microcontroller based circuit system. The system has alcohol as well as pulse monitoring sensors to check for alcohol consumption as well as inappropriate pulse monitoring. This ensures no occurrences of accidents due to alcohol influence or bad health conditions.

INTRODUCTION

In low- and middle-income countries, an increasing number of people have chronic illnesses due to a different risk factors like eating habits, inactivity, and alcohol consumption among others. According to World Health organization, 4.9 million people die from lung cancer through snuff use, 2.6 million obese people, 4.4 million high cholesterol and 7.1 million high blood pressure. Chronic diseases vary greatly in their symptoms evolution and their therapies. Some, if not observed and treated early, can end a patient's life.[1] For many years the standard method for measuring blood sugar, blood pressure, and heart rate was traditional tests in specialized health facilities. With the advent of technology today, there is a huge diversity of sensors that learn important signals such as a blood pressure monitor, a glucometer, a heart rate regulator, including electrocardiograms, which allows patients to take essentials daily. Daily readings are sent to doctors and they will recommend medication and exercise procedures allow them to improve the quality of life and overcome such diseases. The internet of materials used in the care of patients is becoming increasingly common in the field of health, which improve the quality of life of the people. Internet of Things is defined as the integration of all devices connected to a network, which can be controlled from the web and provide information in real time, allowing communication with the users. On the other hand, the Internet of Things can be seen from three paradigms, namely the middleware centred on the Internet, objects information-oriented and informative senses.[2] Arduino is a tool that can be programmed to understand and interact with its environment. It is a good open source a microcontroller platform that allows electronics enthusiasts to build quickly, easily and at low cost with minimal use and monitoring projects. The combination of IoT and Arduino is a new

way to introduce the Internet of Things to Health Care Monitor the patient system. The Arduino Uno Board collects data from sensors and transmits wirelessly to the IoT website.

A Remote health monitoring system is an extension of a hospital medical system where a patient's vital body state can be monitored remotely. Traditionally the detection systems were only found in hospitals and were characterized by huge and complex circuitry which required high power consumption. Continuous advances in the semiconductor technology industry have led to sensors and microcontrollers that are smaller in size, faster in operation, low in power consumption and affordable in cost. This has further seen development in the remote monitoring of vital life signs of patients especially the elderly. The remote health monitoring system can be applied in the following scenarios: 1. A patient is known to have a medical condition with unstable regulatory body system. This is in cases where a new drug is being introduced to a patient. 2. A patient is prone to heart attacks or may have suffered one before. The vitals may be monitored to predict and alert in advance any indication of the body status. 3. Critical body organ situation 4. The situation leading to the development of a risky life-threatening condition. This is for people at an advanced age and maybe having failing health conditions. 5. Athletes during training. To know which training regimes will produce better results. In recent times, several systems have come up to address the issue of remote health monitoring. The systems have a wireless detection system that sends the sensor information wirelessly to a remote server. Some even adopted a service model that requires one to pay a subscription fee. In developing countries, this is a hindrance as some people cannot use them due 2 to cost issue involved. There is also the issue of internet connectivity where some systems to operate, good quality internet for a real-time remote connection is required. Internet penetration is still a problem in developing countries. Many of the systems were introduced in the developed countries where the infrastructure is working perfectly. In most cases, the systems are adapted to work in developing countries. To reduce some of these problems there is need to approach the remote detection from a ground-up approach to suit the basic minimal conditions presently available in developing countries. A simple patient monitoring system design can be approached by the number of parameters it can detect. In some instances, by detecting one parameter several readings can be calculated. For simplicity considerations parameter detection are: i) Single parameter monitoring system: In this instance, a single parameter is monitored e.g. Electrocardiogram (ECG) reading. From the ECG or heartbeat detection, several readings can be got depending on the algorithm used. An ECG reading can give the heart rate and oxygen saturation. ii) Multi-parameter monitoring system: This has multiple parameters being monitored at the same time. An example of such a system can be found in High Dependency Units (HDU), Intensive Care Units (ICU), during the surgery at a hospital theatre or Post surgery recovery units in Hospitals. Several parameters that are monitored include the ECG, blood pressure, respiration rate. The Multiparameter monitoring system basically proof that a patient is alive or recovering. In developing countries, just after retiring from their daily career routine majority of the elderly age group, move to the rural areas. In developed countries, they may move to assisted living group homes. This is where a remote health monitoring system can come in handy.

The carelessness and unconsciousness of the drunken drivers creates a huge problems to the people on road. In the modern era, Road Safety is considered to be one of the mostly concerned social issues. The habit of drunken driving

causes damage to the surroundings and every person around him. The consumption of alcohol results in unconsciousness and fatigue while driving. The Government has taken many preventive measures to avoid drunken drive accidents. In order to minimise the DUI (Driving Under Influence of alcohol) related accidents, Supreme Court has ordered to shut down all the selling points on National and State Highways on Dec 15, 2016. But it's effective implementation is not possible due to many social political issues. However we can minimise the accidents by installing the proposed system inside the vehicle. This system continuously monitors the air exhaled by the driver with the help of MQ-3 sensor (alcohol sensor) and update these values in cloud through IoT. If any alcohol detection is found above the threshold value then the system stops the vehicle ignition system. This action is achieved by stopping the fuel supply to the ignition system. And also, the deaths due to cardiac arrest while driving is more. So, this system is constructed to monitor the heart beat rate of the driver. Heart beat rate monitoring sensor is used to monitor the driver's heart beat rate and these readings are stored in the cloud through IoT. If any abnormal heart beat rate is detected, then the system will send the driver's current status to their friends using IoT. The proposed system is highly efficient in monitoring the alcohol consumption level and heart beat rate of the driver. Since the sensor readings are stored in the cloud, it can be used in future.

Existing System:

In contemporary society, there is a growing demand for effective and user-friendly health monitoring systems due to increasing awareness of health and well-being. Individuals seek accessible tools to monitor vital parameters like temperature, humidity, pulse rate, and alcohol levels in real-time. However, existing solutions often lack integration, accessibility, and immediate feedback, hindering efficient health tracking. Moreover, remote monitoring options are limited, making proactive well-being management challenging, especially in situations requiring immediate intervention.

Disadvantages of Existing system :

- Lack Integration
- Accessibility
- Immediate Feedback
- Hindering Efficient Health Tracking

PROPOSED METHODOLOGY

In this system, mq3(alcohol) sensor is placed at helmet of the driver to detect the alcohol consumption level of driver and heart beat sensor is placed at the handle-bar of the motorbike to monitor the heart beat rate. The results obtained by the sensors are analog values and it is processed by the controller with the help of wifi through internet. The results obtained from sensors are constantly updated to cloud using IoT. When the resultant values obtained from alcohol sensors attains the threshold limit, then the system prevents the chances of accident by stopping the vehicle ignition system and stores the alcohol consumption values to the database of the vehicle user. The heart beat rate of the driver is also continuously monitored with the help of appropriate heart beat rate detection sensor and the data are updated in the database. In case of any abnormal detections in heart beat rate of the driver, then the current status of the person are informed to their relatives through IoT.

Advantages:

1. IoT Platform
2. Health tracking
3. Alcohol Detection
4. Continuously Monitoring

LITERATURE STUDY

2.1 Development and Clinical Evaluation of a Home Healthcare System Measuring in Toilet, Bathtub and Bed without Attachment of Any Biological Sensors Daily monitoring of health condition at home is important for an effective

scheme for early diagnosis, treatment, and prevention of lifestyle-related diseases such as adiposis, diabetes and cardiovascular diseases. While many commercially available devices for home health care monitoring are widely used, those are cumbersome in terms of self-attachment of biological sensors and self-operation of them. From this viewpoint, we have been developing a non-conscious physiological monitoring system without attachment of any sensors to the human body as well as any operations for the measurement. We developed some devices installed in a toilet, a bath, and a bed and showed their high measurement precision by comparison with simultaneous recordings of ordinary biological sensors directly attached to the body. To investigate that applicability to the health condition monitoring, we developed a monitoring system in combination with all the monitoring devices at hospital rooms and previously carried out the measurements of patients' health condition. Further, in this study, the health conditions were measured in 10 patients with cardiovascular disease or sleep disorder. From these results, the patients' health conditions such as the body and excretion weight in the toilet, the ECG during taking the bath and the pulse and respiration rate during sleeping were successfully monitored in the hospital room, demonstrating its usefulness for monitoring the health condition of the subjects with cardiovascular disease or sleep disorder. 8 2.2 Intelligent wireless mobile patient monitoring system Nowadays, Heart-related diseases are on the rise. Cardiac arrest is quoted as the major contributor to the sudden and unexpected death rate in the modern stress filled lifestyle around the globe. A system that warns the person about the onset of the disease earlier automatically will be a boon to the society. This is achievable by deploying advances in wireless technology to the existing patient monitoring system. This paper proposes the development of a module that provides mobility to the doctor and the patient, by adopting a simple and popular technique, detecting the abnormalities in the bio signal of the patient in advance and sending an SMS alert to the doctor through Global System for Mobile(GSM) thereby taking suitable precautionary measures thus reducing the critical level of the patient. Worldwide surveys conducted by World Health Organization (WHO) have confirmed that the heart-related diseases are on the rise. Many of the cardiac-related problems are attributed to the modern lifestyles, food habits, obesity, smoking, tobacco chewing and lack of physical exercises etc. The post-operative patients can develop complications once they are discharged from the hospital. In some patients, the cardiac problems may reoccur, when they start doing their routine work. Hence the ECG of such patients needs to be monitored for some time after their treatment. This helps in diagnosing the improper functioning of the heart and take precautions. Some of these lives can often be saved if acute care and cardiac surgery is provided within the so-called golden hour. So, the need for advice on first-hand medical attention and promotion of good health by patient monitoring and follow-up becomes inevitable. Hence, patients who are at risk require that their cardiac health to be monitored frequently whether they are indoors or outdoors so that emergency treatment is possible. Telemedicine is widely considered to be part of the inevitable future of the modern practice of medicine

4. DESIGN OF HARDWARE

ARDUINO UNO

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz ceramic resonator, a USB connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer

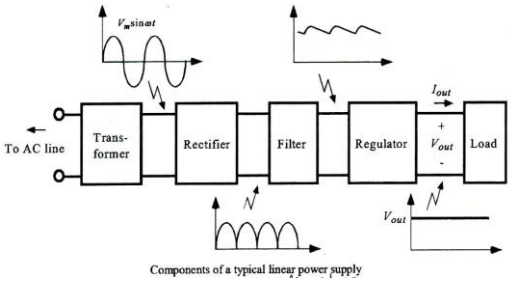
with a USB cable or power it with a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-to-serial driver chip. Instead, it features the Atmega16U2 (Atmega8U2 up to version R2) programmed as a USB-to-serial converter. Uno board has a resistor pulling the 8U2 HWB line to ground, making it easier to put into DFU mode.

Fig: ARDUINO UNO

4.2. POWER SUPPLY

The power supplies are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can by broken down into a series of blocks, each of which performs a particular function. A d.c power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as "Regulated D.C Power Supply".



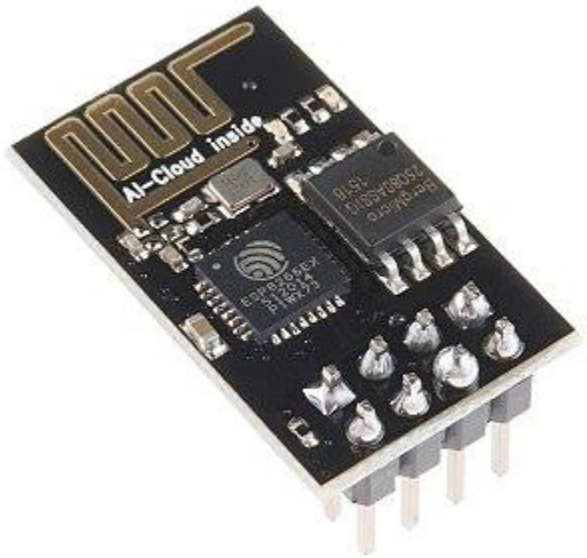
Components of a typical linear power supply

ESP8266 WIFI

The **ESP8266** is a low-cost Wi-Fi microchip with full TCP/IP stack and microcontroller capability produced by Shanghai-based Chinese manufacturer, Espressif Systems.[1]

The chip first came to the attention of western makers in August 2014 with the **ESP-01** module, made by a third-party manufacturer, Ai-Thinker. This small module allows microcontrollers to connect to a Wi-Fi network and make simple TCP/IP connections using Hayes-style commands. However, at the time there was almost no English-language documentation on the chip and the commands it accepted.[2] The very low price and the fact that there were very few external components on the module which suggested that it could eventually be very inexpensive in volume, attracted many hackers to explore the module, chip, and the software on it, as well as to translate the Chinese documentation.[3]

The **ESP8285** is an ESP8266 with 1 MiB of built-in flash, allowing for single-chip devices capable of connecting to Wi-Fi.[4]



4.7. LCD DISPLAY

A model described here is for its low price and great possibilities most frequently used in practice. It is based on the HD44780 microcontroller (Hitachi) and can display messages in two lines with 16 characters each. It

displays all the alphabets, Greek letters, punctuation marks, mathematical symbols etc. In addition, it is possible to display symbols that user makes up on its own. Automatic shifting message on display (shift left and right), appearance of the pointer, backlight etc. are considered as useful characteristics.

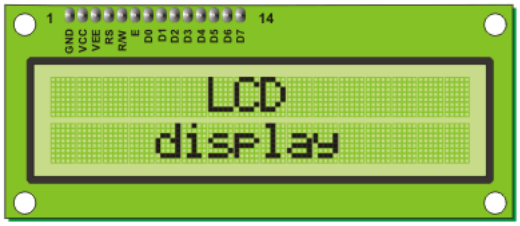
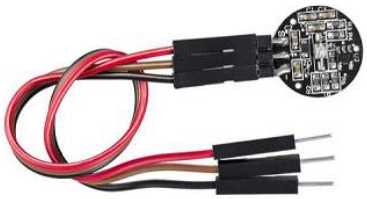


Fig: 4.10. LCD

BUZZER:

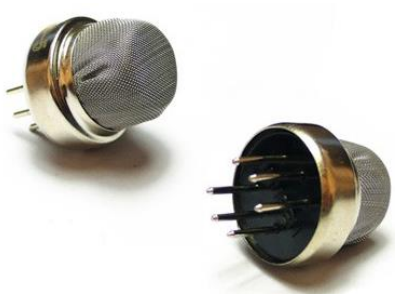
Digital systems and microcontroller pins lack sufficient current to drive the circuits like relays, buzzer circuits etc. While these circuits require around 10milli amps to be operated, the microcontroller's pin can provide a maximum of 1-2milli amps current. For this reason, a driver such as a power transistor is placed in between the microcontroller and the buzzer circuit.

Pulse Sensor



PulseSensor is a reflection type photoelectric analog sensor used to measure pulse and heart rate. Having been worn around the finger or earlobe, the sensor can transmit the collected analog signal to MCU. And then the analog signal will be converted into digital signal. With simple calculation finished, the MCU gets heart rate values and uploads them to computer for drawing the pulse waveform. PulseSensor is an open source hardware, suitable for scientific research and teaching presentation on heart rate subject and secondary development.

Alcohal DETECTOR:



MQ2 flammable gas and smoke sensor detects the concentrations of combustible gas in the air and outputs its reading as an analog voltage. The sensor can measure concentrations of flammable gas of 300 to 10,000 ppm. The sensor can operate at temperatures from -20 to 50°C and consumes less than 150 mA at 5 V.

Connecting five volts across the heating (H) pins keeps the sensor hot enough to function correctly. Connecting five volts at either the A or B pins causes the sensor to emit an analog voltage on the other pins. A resistive load between the output pins and ground sets the sensitivity of the detector. Please note that the picture in the datasheet for the top configuration is wrong. Both configurations have the same pin out consistent with the bottom configuration. The resistive load should be calibrated for your particular application using the equations in the datasheet, but a good starting value for the resistor is 20 kΩ.

6. PROJECT DESCRIPTION

This chapter deals with working and circuits of "GAS LEAKAGE ALERT SYSTEM". It can be simply understood by its block diagram &circuit diagram.

5.1. BLOCK DIAGRAM:

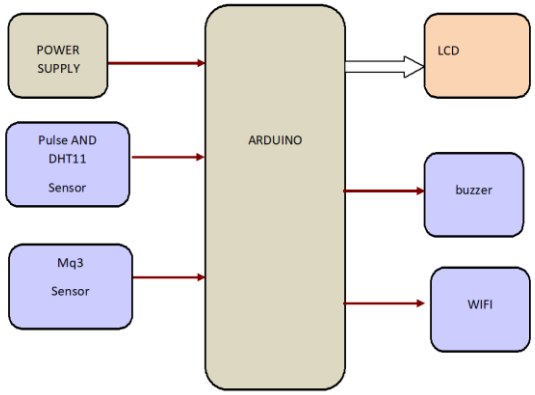


Fig 6.1 block diagram

6.4. WORKING

All these sensors data is process by the microcontroller, if any dangerous event is occurred. Microcontroller processes receive signal and gives towards LCD display and buzzer

In receiver section, when APP receiver receives alert signal then this signal is gives to the APP. Microcontroller processes receive signal and gives towards LCD display and buzzer AND motor off

Advantages:

1.The proposed module can reduce the accidents due to drunken drive.

2.The module is useful to observe the user's position whether they drunken or not

3.This module can be very helpful for policeto decrease the drunken drive accident cases.

4.The app can be installed by mobile users and enter the channel ID to see the current status.

CONCLUSION AND FUTURE SCOPE

In today's world, the accidents due to drunken drive and rash driving causes a great damage to the lives of common people. Even though, the government passes many bills and laws to minimise and control the accidents done under the influence of alcohol. But it is not effective. However, the proposed system could minimise and control the accidents made due to drunken and drive. This system continuously monitors the alcohol level consumed by the driver and when, it attains the maximum threshold value then the system stops the ignition system of the vehicle preventing the accidents. Moreover, it also monitors the heart beat rate of the driver frequently. The sensor readings are updated in the cloud from time to time through IoT

REFERENCES

1. Keerthana K, Ramya G DRUNK DRIVING DETECTION USING CARIGNITION LOCKING 2018 International Journal of Pure and AppliedMathematics.

2. Tejaswini Patil, Aliya Tabassum AUTOMATIC ENGINE LOCKING SYSTEM ALCOHOL DETECTION FOR DRUNK & DRIVE WITH GSMNational Conference on Advances in Engineering and Applied Science.

3. Muthulakshmi.M, Santhiya.K, Prof.Dhivya.P- SMART HELMET SYSTEM USING ALCOHOL DETECTION FOR VEHICLE PROTECTION, IJIRTSE,ISSN: 2395-5619, Volume – 2.

4. Prof. Kulkarni P.H, Ms. Ravina Wafgaonkar, Mr. Gaurav Ahirrao ALCOHOL DETECTION AND AUTOMATIC DRUNK AND DRIVE AVOIDING SYSTEM International Journal of Engineering Research and ApplicationsApril 2014.

5. M.H. Mohamad, Mohd,AminBin Hasanuddin,"Vehicle Accident Prevention System Embedded with Alcohol Detector",IJRECE,Volume 1-Issue 4. 6. "Alcohol Detection and Accident Prevention of Vehicle", IJIERE, Volume-2, Issue-3, 2015.