IOT Based Driver Drowsiness Detection and Health Monitoring System

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Abstract:

This guide discusses driver somnolence and fatigue-related safety criteria. FatigueDriver exhaustion is usually a very severe issue in many thousand bridge crashes a year. The exact number of accidents can not be calculated due to sleepiness, but research shows that 20% of accidents occur only through fatigue (rospa).This platform gives the Eye-Blink Surveillance System USB camera and provides a buzzer that warns the driver during a state of sleep. Driver health monitor is provided through a wearable heart beat sensor, temperature sensor, by means of the proposed web application design manager will check system parameters and send a message to his college colleague. The alcohol indicator is used to measure the drug level of a driver and the pace of the car reduces if this condition occurs.
Keywords:Health Monitoring, Alcolhol Detection, Eyes Detection.

1   Introduction:

Internet of Things (IOT) is the network management of physical objects, which involves gadgets within their architecture to impart and detect relationships amongst them or about the external situation. IOT-based creativity in the years to come will deliver powered aspects of government and transform the way citizens conduct their everyday lives with any reason. Prescription, monitoring, quality treatments, agriculture, lively Just a few of the utter precedents where IOT is firmly founded are metropolitan areas and brilliant buildings. Drowing is an significant issue in India. Drought driving warns the risk and sometimes ruinous outcomes. The unpleasant mixture of driving and sleepiness or exhaustion is Drowsy activity.

This typically comes in because a driver did not sleep properly, but sometimes because of drugs, medication or shift. This is currently occurring. Fig.1 reveals, in fact, the year of "Drowsy traffic collisions."The drinking and driving rates has however rising. Perhaps 200 people have been killed last year while drinking and driving. Not only is the driver impacted

by it, it often affects the customers and other travelers. In 2016, 100 footsloggers and even 390 car occupants sustained significant injury or fatalities from drunk drivers. In that year 40 children were murdered by drink drivers or severely injured.It is clearly dangerous to fall asleep during driving, but this affects the driverâ s ability to drive safely. As seen in fig. 1 in 2013, 44 000 accidents have occurred and 800 fatalities have occurred in 2013, attributed to vehicle drowsiness (National Highway Traffic Safety Administration).

2   Related work:

This paper provides a stand-alone framework for measuring air quality in real time that involves specific parameters: PM 2.5, carbon monoxide, carbon dioxide, temperature, moisture and pressure[1]. The Internet of Things is now being used widely in all industries and plays a vital role in our air quality network. The Internet of Things that converges with cloud computing.The model proposed consists of environmental sensing units (such as humidity, temperature, heat index, power, etc.) which are able to track the energy consumed in voltage and current parameters of the different household equipment. The regulating mechanism calibrates further[2] to generate aggregated data and eventually gathers this data on the Internet portal.For this article, we focussed mainly on protection precautions for both the driver and the car by utilizing three forms of sensors. The pulse sensor is used to continuously track the driver's pulse rate[3] and avoids IOT incidents. The User, [11] Ambulance and police are told of an incident via IOT.

We deliver an revolutionary program that has quickly completed this mission. Our technology provides an advanced health monitoring device, which utilizes sensors to control the safety of patients and uses the Internet to alert the family in the event of a crisis. The temperature and pulse monitoring of our machine is used[4] to track the health of patients.This document is the protective helmet inside the mine used by the worker. In order to constantly track mine conditions, this helmet is designed with specific environmental indicators such as fire, fumes, air temperature, humidity and air quality. All these sensors are linked to an amicrocontroller which [5] is also built into the helmet. The paper also explores the idea of a wireless network to relay data to the central hub utilizing Zigbee technologies from the consumer helmet.

Cloud storage allows fast access to a common pool of distributed computing services, computers, and networks on request. Fog computing can be seen as the cloud computing extension because it offers low latency, low bandwidth and increased data security and privacy. Data violation is an important problem in the healthcare system that can be solved by special data protection acts and special algorithms. In this article[6], the m-health program, the Web, Fog processing and computer protection problems are discussed thoroughly in IOT.Our project's primary goal is to avoid major car accidents that have a significant impact on people's lives. Unlike a regular breathhalyzer, this alcohol monitor is ideal for the measurement of alcohol[7] in your breathing. A hands-free pointer tracker and a remote monitoring and data transfer

system. Eyeball sensors are the most compatible sensors.In fact, we will improve people's wellbeing that have invested a great deal of time in their vehicles by incorporating intelligent sensors that control the internal atmosphere of the vehicle and the driver of the car. A moisturizer that controls the moisture level inside the car and maintains it clean may be used. The pulse oximeter also tests the driver's blood oxygen. The steering wheel of the vehicle may be applied.

Headquartered, dispersed and heterogeneous facilities, instruments and knowledge and connectivity systems, the health services and network are also quite diverse and include a wide spectrum of organisations. With the introduction of the Internet of Things[9] (IoT), robots are introduced into the internet as a "item" and linked to other things. This Chapter clearly shows the long-term benefits of people with robotics and IoT in the fields of health, medical emergencies, e-health etc.The implementation and architecture purpose of an intelligent and real-time drainage and control device with the help of the Internet of Things is discussed in this article. A [10] modulus with an interface between the microcontroller and[12] gas sensor, level indicator, and NRF will be mounted for the drainage loops.

2   Proposed method:

The implementation of a preventive program for this matter has become a big challenge. The eye condition and safety parameters examination are calculated in this method. Designed by the driver's head, the Raspberry Pi and the USB device are. When a driver's eyes were closed for longer than 5 seconds, buzzer was triggered and the driver was warned. Health metrics such as the temperature of the body and heart beats have been calculated with the heart beats monitor and the heart beats monitor, respectively. The engine speed reduces as alcohol is found. GPS can be used for monitoring the position of the driver, and will hit his colleague there as well as hospitals to help him. This data can also be sent to the server (Cloud) to deliver a message to his colleague in order to alert the driver.

DESIGN REQUIREMENT

A. Hardware
   ➢ Raspberry-pi 3
   ➢ Temperature Sensor(DHT-11)
   ➢ USB Camera
   ➢ Alcohol/Gas Sensor(MQ-3)
   ➢ Heart Beat Sensor
   ➢ GPS
   ➢ Speed Limiter
   ➢ Buzzer

B. Software
   ➢ Python IDE
   ➢ HTTP
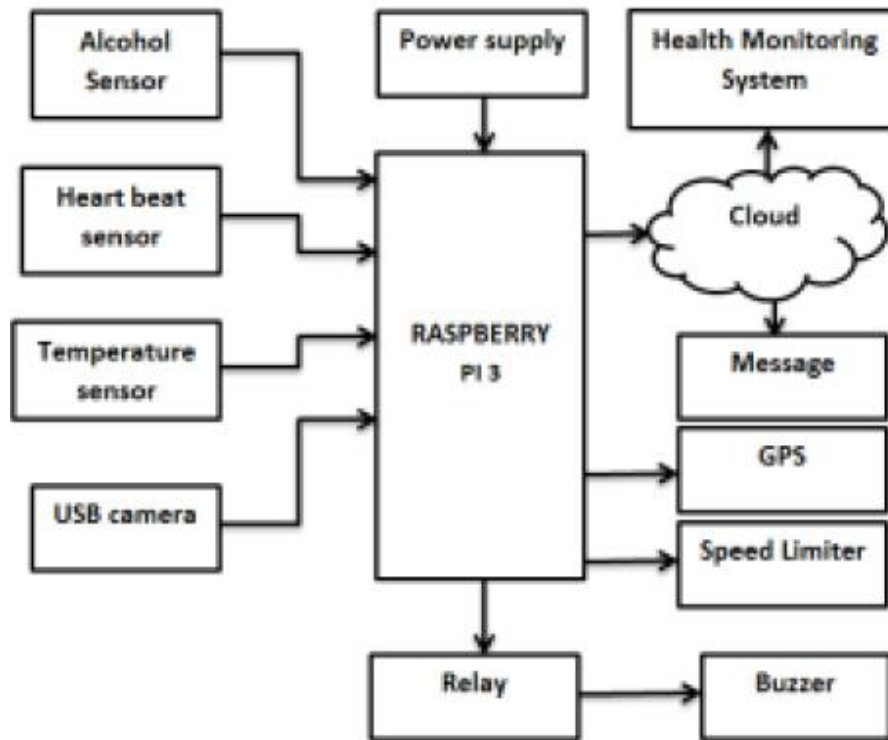   ➢ Communication Protocol

➤ OpenCV

Figure 1. System block diagram

Description of Block Diagram:

The IOT-based driver drowsiness prediction and safety tracking device block diagram as seen in fig.1 above. The raspberry pi-3, GPS, USB button, speed limit and buzzer are the main elements of the phone. Heart beat sensors and temperature sensors are used to calculate the safety parameters as an input for raspberry pi-3. Alcohol Monitors are used for monitoring the driver's intoxicated condition. Speed limiters are given for the regulation of this condition. The pace of the car reduces as alcohol is observed. The driver's eye location can be tracked continuously with a USB device. If the eyes of the driver are closed longer than 5seconds, the buzzer may start. The buzzer driver's vibration triggers wake-up. This will avoid the crash. Both data sent to the server safety surveillance network. The details on the status of a driver was transmitted via a letter to your driver colleague. The driver's position can even be monitored by GPS, even though an accident arises. To get support from the hospitals for the driver.

A.Information of Raspberry pi 3

Raspberry Pi 3 comprises of a compact Kernel, GPIO-pins, USB- ports, and CSI interfacing features, DSI. Fig.2 displays the raspberry pi setup. As presented in 2016, Raspberry Pi 3 B is part of a quad center processor that is more than 80% faster than Raspberry Pi 2, showing a better performance on several occasions.
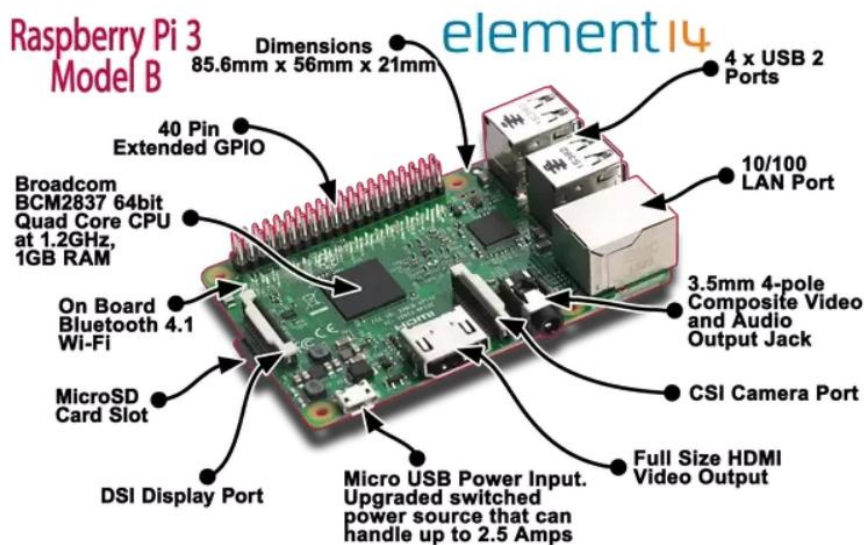
Figure 2. Raspberry Pi 3

B. Heartbeat Sensor

Optical strength variance will calculate the heart rhythm. The sensor begins operating and measures driver pulse and the output is provided by Raspberry Pi when the driver's finger is on the sensor. The present heartbeat sensor is seen in Fig.3. It comprises three buttons, i.e. 5V, lock, lock. The Heart Beat Monitor follows the theory of imaging. This monitors blood pressure such that the level of light changes.

Figure 3. Heartbeat sensor

C. Temperature Sensor DHT11

DHT11 sensor pin configuration shown in fig. 4. He's got 3 buttons, that is. DATA pin and VCC. This sensor is also named the Optical Sensor Data Button. The sensor DHT11 is capable of calculating the temperature and moisture. It has excellent long-term stability and high reliability. The thermistor and resistive portion are of the NTC form. The input voltage needs + 5V. This sensor's temperature range is 0-50 ° C with errors of + /- 2 ° C and a wetness scale of 20-90%.
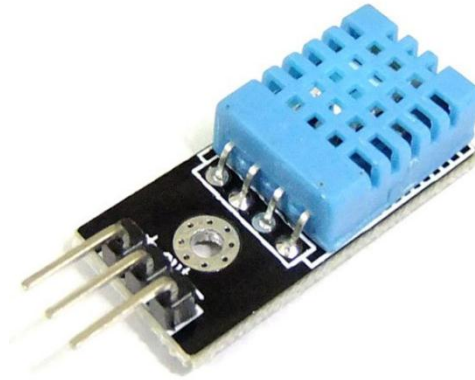
Figure 4. Temperature Sensor

D. Alcohol sensor(MQ3)

This sensor is used to measure spirit concentration on your body. It's highly affective and has a strong response. It is easy to discern between 0,05 mg / L and 10 mg / L for the semiconductor sensor. This sensor can produce easy as well as computerized results. It is compact with Raspberry Pi, Arduino boards and microcontrollers. The MQ3 liquor sensor is shown in Fig.5. There are four VCC sticks, dirt, computerized production and a single production handle.
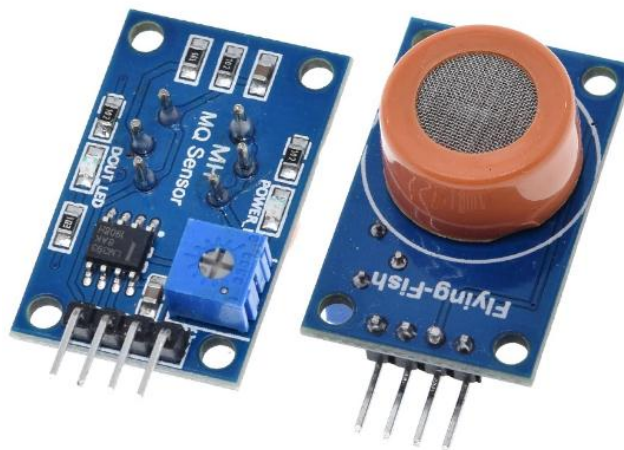

Figure 5. Alcohol Sensor MQ3

E. USB Camera

Any operating system can conveniently connect USB device. The transmission rate is 480 Mb / s for USB technologies. The transfer rate is also possible up to 5 Gb / s. Different USB cameras are eligible for Edmunds Optics. CMOS and CCD sensor style EO USB cameras are available. The USB camera is seen in Fig.6.

Figure 6. USB Camera

F. GPS System

The global positioning system is a satellite route structure that provides the consumer with location and time data in any environment. In fact, GPS is used for routes of airplanes, vessels, automobiles and trucks. The system supplies military and common people around the globe with essential capacities. The worldwide positioning system offers continuous, path and timing worldwide. Image. 9 reveals how accurate GPS synchronization is.

Figure 7. GPS Tracking system

G. Speed limiter

Speed limiters are used in emergencies to reduce the car level. This speed restriction is seen where the speed of the car increases in intoxicated condition. This avoids the crash.

H. Buzzer

In PCs, printers, routers, advisories, electronic games, industrial electronic devices, telephones, clocken and other computer products for voicing devices, the balls usually are like an mechanical ringer with a synchronized arrangement. Dynamic and uninvolved signals may be organized. A bell or beeper is a electronic, electromechanical or piezoelectric device.

I.Cloud Computing

Cloud registration allows PC system assets available on an interest basis, particularly capability and figuring power without direct dynamic customer management. The word is also used to describe server farms that are open through the Internet to multiple customers. Currently, extensive mists frequently transmit resources from focal servers across different regions. If the connection with the client is normally near, an Edge server may be allocated. This framework uses the Cloud feature for the network management of the health control centre.

3   Result and discussion:

The Fig.8.Python app displays the hardware configuration that helps you to pick the region of interest around your eyes. A rectangular or square box is used to locate the eyes as shown in fig. Eleven. Device senses open and closed eyes. The driver would be warned if the driver has drowsiness and is open and near to his head.
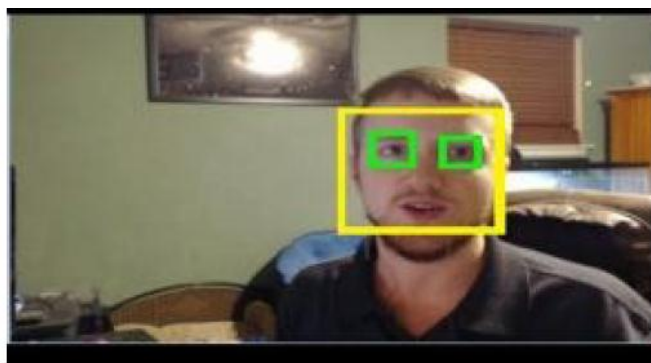

Figure 8. Hardware setup

Figure 9. Sleep state of person

Determine even the physiological criteria, i.e. the body beat and temperature in graph or table shape. As in Fig. seen. 10

Figure 10. Graph of temperature and humidity

4   Conclusion:

This paper analyzes and advances the IOT program for detecting drivers drowsiness and tracking safety. Our initiative is aimed at helping to address the real issue in a cost-. The buzzer is exploded when the driver becomes drowsy and shuts his eyes for about a second. The machine used a pulse monitor and temperature to calculate the driver's safety parameters. A system used for alcohol monitors the driver's drunken state. The car would be low speed when alcohol is found. Doctors or his colleague will contact him through GPS, even if there is some emergency. This reduces the incident level. Therefore, our business-developed project should save the important driver's existence.

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