International Journal of Research
Available at https://edupediapublications.org/journals
e-ISSN: 2348-6848
p-ISSN: 2348-795X
Volume 04 Issue 13
October 2017

An Iot Based Intelligent Embedded Controlling For Mishap Counteractive Action System for Transportation

[1]SHAIK SHAFIYA, [2]PARACHOORI SAI KRISHNA
[1]ASSISTANT PROFESSOR, NALLA NARASIMHA REDDY GROUP OF INSTITUTIONS, HYDERABAD
[2]ASSISTANT PROFESSOR, SREE RAMA INSTITUTE OF TECHNOLOGY AND SCIENCE, KUPPENAKUNTLA

ABSTRACT: Certainly, road accidents can be avoided by understanding the psychological state of drivers. Most of the road accidents are occurred during night driving. The sleepiness state of vehicle drivers (subject) is the cause for road accidents. Eye Blink Monitoring System (EBM) is presented to avoid road accidents. This EBM system provides the subject to alert during the state of drowsiness. The psychological state of the subject can be determined by the monitoring the subject by using IR sensor for eye blink rate and an accelerometer is used for head movement. A normal rate of eye blink has no effect on the resultant of the system. An Internet of Things (IOT) allowed the sensors are used to transmit the entire data collected by sensors over a smart grid network for quick response team to take actions in the emergency conditions.

KEYWORDS: Internet Of Things (IOT), RFID, Eye Blink Monitoring System (EBM) , M2M- machine to machine communication, IPv6, URL- universal resource locator, URN- universal resource name, sensors, drowsiness, accident prevention system.

I.INTRODUCTION

The Internet of Things (IOT) is the connection of embedded computing devices. This IOT provides the connectivity of systems, devices and services. IOT also covers the various protocols, domains and applications. In IOT, the term 'Thing' is mentioned for a wide variety of devices. These devices are named as heart monitoring implants, biochip transponders on farm animals, electric clams in coastal waters, automobiles with built-in sensors.

In this paper, an internet based system is presented that is Eye Blink and Head movement Monitoring System. This system will help the drivers to alert when they are in the state of drowsiness. The basic principle of this system is monitoring the eye movement and head movement by using the IR sensor and Accelerometer respectively. If subject fell asleep, then an alarm will rang to wake up the subject.

These devices will exploit an IP address. This IP address is a unique identifier. The address space of IPv4 is limited. The object in the IOT will use IPv6 which has large address space than the IPv4. In IOT, the objects will give the devices with sensory capabilities and also with the actuation capabilities.

In future, IOT will impossible without support of IPv6. Necessary and sufficient cause of an accident is a combination of simultaneous and sequential factors, each of which is necessary but none of which is by itself sufficient. The task of ensuring safe traffic on the urban roads in India is difficult mainly due to the mix of slow and fast moving vehicles, sharing the same carriage way.

II.EXISTED SYSTEM

The Block diagram in fig 1 consists of fallowing components. They are

1. LCD Display
2. Drowse Sensors (IR sensors)

3. LM358 Comparator
4. NXP RD25 (8051 Microcontroller)
5. Vibrator
6. Engine Speed Controller
7. Analog to Digital Converter (ADC)
8. Gravity Sensors (3- axis accelerometer)
9. GSM & GPRS Module (Mobile phone)
10. Power Supply (12V 2Amp. DC+ SMPS)

The embedded system is interfaced with another mobile which is having android platform through an IOT application. This application gives the notification to the host about the status of embedded system in the state of drowsiness.

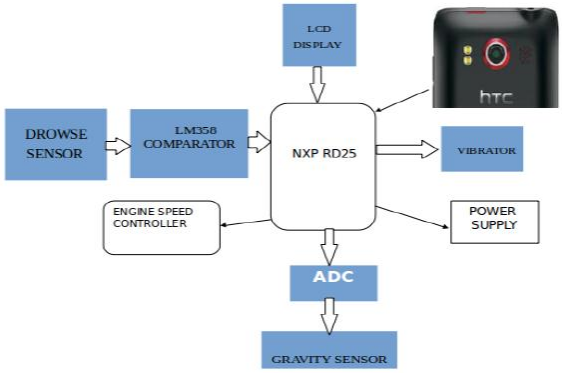

FIG 1. BLOCK DIAGRAM OF IMPLEMENTED PROTOTYPE

DESCRIPTION: In this system, IR sensor and accelerometer are used for the measurement of eye blink and head movements of the subject. The transmitter of IR sensor is utilized to transmit the infrared rays in to eye and receiver is utilized to receive the reflected infrared rays from eye. To realize that the eye is in closing or opening position, the output is supplied to a logic circuit for indicating alarm and status will exhibited on the LCD display.

MONITORING EYE MOVEMENT: By Monitoring Eye Movement, we can identify that the person is in the state of drowsiness or not. The monitoring rate of eye blink is measured by IR light which is reflected from the surface of the eye. The eye is illustrated by an IR LED, powered by +5V power supply. IR photo diode is used to record the reflected light. The reflected light is transformed in to electrical signal by the IR photo diode and this electrical signal is given to the op-amp.

The op-amp output is based on the light intensity which is received by the IR photo diode. The micro controller operates the buzzer which is according to the op-amp output. The digital display supplies various messages to the user. When the eye is open then maximum amount of light will be reflected from the eye since our eyeball is transparent. The minimum amount of light will be reflected from the eye, when it is closed as skin part of eye is opaque.

MONITORING HEAD MOVEMENT: The single step Accelerometer is utilized for monitoring the head movement. For example ADXL330 measures 3-axis detection. It contains input as angle based accelerometer (ACC). The analysis of movement is performed by the translating the tilt angle data to displacement of mouse cursor. It calculates new head position.

These are two main methods for measuring the new head position:

i. Absolute mapping: This mapping includes each tilt angle is relative to a position on screen.

ii. Relative mapping: This mapping includes each tilt angle is relative to a head displacement amount. This amount is summed by the coordinates of the head‘s old position, to calculate new position.

III.PROPOSED SYSTEM

The block diagram of proposed system is shown in below figure.

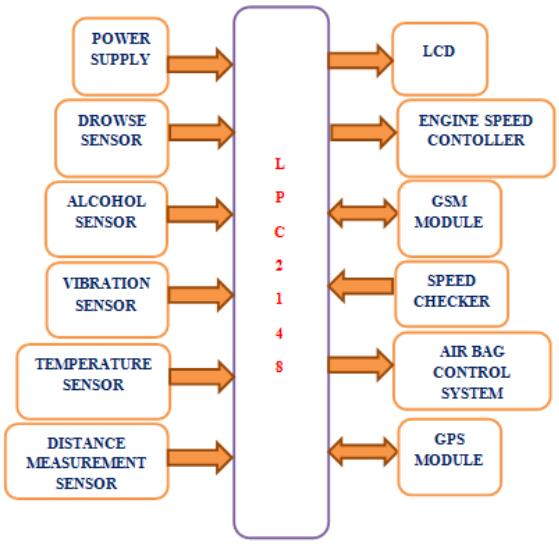

FIG 2. AN IOT BASED ACCIDENT PREVENTION &TRACKING SYSTEM FOR NIGHT DRIVERS

The block diagram of fig2 consists of fallowing components.

1. Power supply
2. Drowse sensor
3. Alcohol sensor
4. Vibration sensor
5. Temperature sensor
6. Distance measurement sensor
7. LCD
8. Engine speed controller
9. Speed checker
10. Air bag control system
11. GSM module
12. GPS module
13. ARM7 based Micro controller (LPC2148)

Our proposed system consists of different types of sensors such as Alcohol sensor, Drowse sensor, Vibration sensor, Temperature sensor and Distance measurement sensor.

Drowse sensor provides the information about state of drowsiness of subject in driving. Distance Measurement sensor senses the object at a distance. For example when an object is at 10m distance it senses the object and automatically decreases the engine speed by the engine speed controller. Hence, these sensors are utilized for prevention of accidents in proposed system. Speed checker is automatically checks the speed of the object and indicates the speed.

ARM7 micro controller is manufactured by Philips. It is initially loaded with several inbuilt peripherals. It is more efficient and a reliable option for the beginners as well as high end application developer.

The GSM module involved in the designed system is used to effectively track the location of the vehicle. The location of vehicle and nearby emergency service facilities are effectively displayed on the portable android devices of host device and embedded device through Google Maps. The LCD is used to display the results from the sensors. The proposed system is more efficient and helps in the prevention of accidents than other systems. The respective outputs speed, alcohol, temperature, etc., shown below.

IV.RESULTS

The graphical representation of Drowse and temperature sensors is shown in fig 3 & 4.

The status of the sensor is calculated with respect to time.

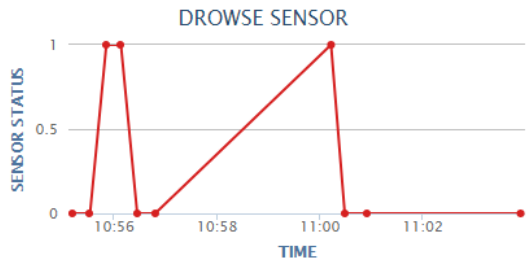

FIG 3. DROWSE SENSOR

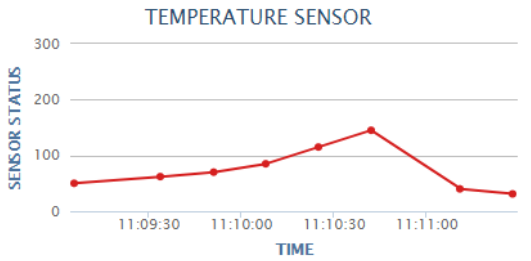

FIG 4. TEMPERATURE SENSOR

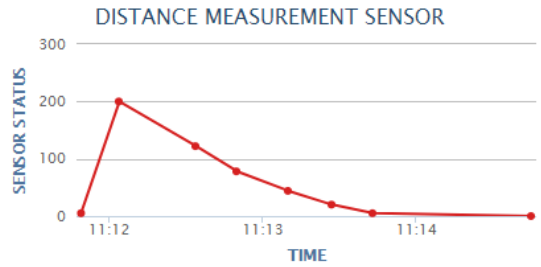

FIG 5. DISTANCE MEASUREMENT SENSOR

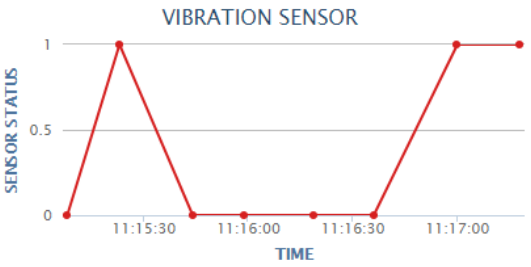

FIG 6. VIBRATION SENSOR

The above figures 5 & 6 shows the graphical representation of the Distance measurement sensor and Vibration sensor. In these graphs the status of the sensor is calculated with respect to time. The below fig 7 shows the Alcohol Sensor.

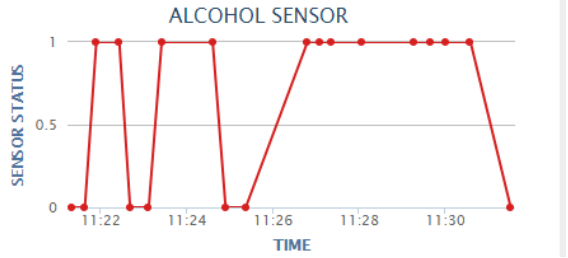

FIG 7. ALCOHOL SENSOR

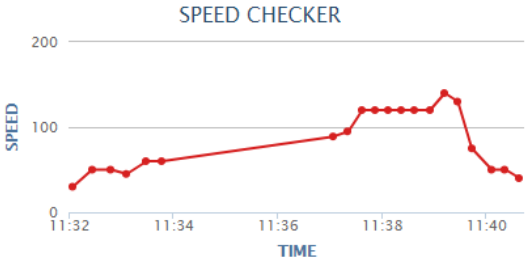

FIG 8. SPEED CHECKER

Fig 8 shows the graphical representation of the speed checker. In this graph the speed is calculated with respect to the time.

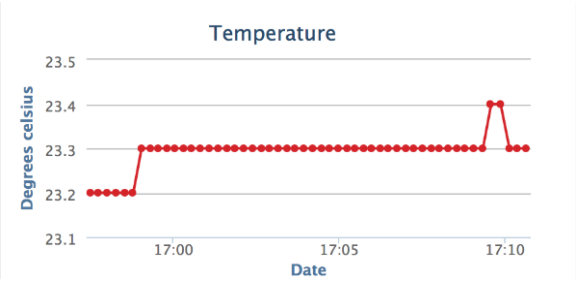

FIG 9. TEMPERATURE

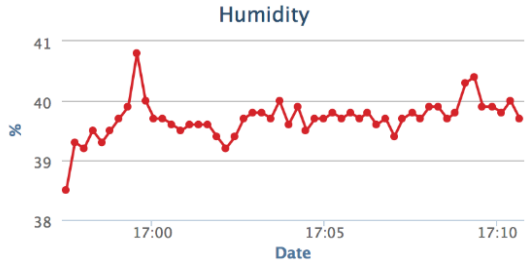

FIG 10. HUMIDITY

The above fig 9 & 10 shows the graphical representation of temperature and humidity. The temperature is calculated based on time. Humidity also calculated with respect to the time.

V.CONCLUSION

Majority of portable devices are aimed at providing unlimited access to internet services for data storage and synchronization with other remote devices. Hence, there is a need of faster data acquisition and quick decision making of embedded computing system for real time applications for making vehicles safe, automatic, intelligent, responsive.

Sensors are interfaced to various micro-controller platforms which allow the simplicity of regulating the embedded system at advanced levels of automation and mediating the sensor information over a smart grid enables large amount of data acquisition for taking accurate decisions over the emergency conditions. Further, the development of smart grids fascinates the overall process of communication between human and machine rather than machine to machine communication. Hence, IOT can convert the way embedded systems interact and respond for various applications mainly in case of vulnerable night drivers by monitoring the state of their drowsiness for a quick, safe and effective response for a safer road travel.

VI.REFERENCES

1. Effective control of accidents using routing and trackingsystem with integrated network of sensors (2013)authors: r. manoj kumar, dr.r. senthil department of electronics and instrumentation, panimalar engineering college, anna university , international journal of advancements in research & technology, volume 2, issue4, april-2013 69issn 2278-7763

2. The Research on Fatigue Driving Detection Algorithm(2013) Authors: Zhui Lin, Lide Wang, Jieqiong Zhou, Tao Wang, School of Electrical Engineering, Beijing Jiaotong University, Beijing, China

3. Distraction Detection and Mitigation Through Driver Feedback (2013 a real time system for detecting drowsiness of driver (2013) Authors: Puja Authors: John D. Lee, Jane Moeckli, Timothy L. Brown, Shannon C. Roberts, Chris Schwarz, Lora Yekhshatyan, Eric Nadler, Yulan Liang, Trent Victor, Dawn Marshall, Claire Davis, DOT HS 811 547A

4. Malvadkar, Bhavana Pansar e& Sachin Pansar International Journal of Management, InformationTechnology and Engineering (BEST: IJMITE) Vol. 1, Issue 1, Oct 2013

5. Detecting Driver Drowsiness Based on Sensors (2012) Authors: ArunSahayadhas *, Kenneth Sundaraj and MurugappanMurugappan AIRehab Research Group, Universiti Malaysia Perlis (UniMAP), KampusPauh Putra, 02600 Arau, Perlis, Malaysia Sensors 2012, 12, 16937- 16953; doi:10.3390/s121216937

6. Sleepy driving in truck drivers: Insights from a self-report survey (2011) Authors: Raymond Misa, Russell Conduit and Grahame Coleman, HFESA 47th Annual Conference 2011. Ergonomics Austral

7. Controlled Inducement and measurement of drowsiness in a driving simulator. (2010) Authors: Helios De Rosario,a* José S. Solaz,a Noelia Rodríguez,b Luis M. Bergasac doi:10.1049/iet-its.2009.0110)