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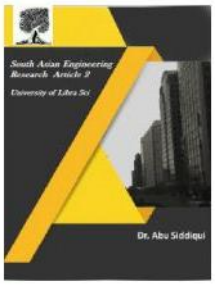

IOT BASED HEART ATTACK AND ALCOHOL DETECTION IN SMART TRANSPORTATION AND ACCIDENT PREVENTION FOR VEHICLE DRIVERS

K. VENKATA RAMANA KUMARI[1], Dr G S SARMA[2]

[1]M.Tech [ES] PG Scholar, Department of ECE, St.Mary's Group of Institution, Guntur, Ap, India.
ramanakumarikoppolu@gmail.com

[2] Professor, Department of ECE , St.Mary's Group of Institution, Guntur, Ap, India.
drsarma@stmarysgroup.com

ABSTRACT: In this modern world, we are depending on devices for doing our work in day-to-day life, which is interconnected through networks of networks. In this paper, we mainly focused on the safety measures for both driver and vehicle by using three types of sensors: Heartbeat sensor, Traffic light sensor and Level sensor. Heartbeat sensor is used to monitor heartbeat rate of the driver constantly and prevents from the accidents by controlling through IoT. IoT conveys the emergency message to the Owner, Ambulance and the Police. Traffic light sensor is used to follow the traffic rules and regulations by the driver. If the Red light is in the ON state, then the vehicle automatically stops before it reaches the white line. Fuel level sensor is used to measure vehicle's fuel level and calculate whether the available fuel is enough to reach the destination or not, if it is not enough then map will suggest the driver to reach the near by petrol bunks.

Key words: ARM7,Heart beat sensor, Fuel sensor, alcohol detection, IoT.

1.INTRODUCTION

Internet of Thing (IoT) has a major growth in this changing world to innovate new ideas to make things smarter. As per the recent survey published by World Health Organization [12] (WHO) reveals that most of the accidents in India occur due to the cardiac arrest while driving. India has the second largest road network in the world with about 3 million km path in which 60% of the roads are paved. According to a survey around 336 people die each day in the road accident ARM7 Controller is used to implement things easier in IoT. Heartbeat sensor is used, which monitors driver's heartbeat rate before he takes off. Traffic Light sensor is also used to avoid accidents by following traffic rules and regulations. Fuel Level sensor helps driver to locate a Petrol stations nearby if the fuel is not sufficient to reach the destination. In this concept driver's must follow the rules like buckle up seat belt, cannot able to drink and drive, and cannot able to run through the car in red signal.

2. LITERATURE SURVEY

In [1] describes about 2029, approximately after 35 years the Internet went important, and today the world, its people, and devices

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are connected in ways that the Internet's importance could never have imagined. In [5] is about the fuel emission and how much air pollution is happening due to vehicle's engine is running in red sign. In [2] describes about waiting time in traffic signal for unwontedly that is if there is no vehicles crossing the road even though they have to wait, so by making traffic lights to change according to the number of vehicles waiting in the signal. In [6] describes about the automatic driving car using cameras for recognizing the white lines and signs. In [10] describes about the safety camera is fixed inside vehicle for monitoring the driver whether the driver is following the rules like applying brake for stop sign and driving manner. In [9] describes about the wearable glass which alert the driver using cloud computing and guiding driver for take necessary action according to situation Now a day's road accidents are becoming serious public health problem. The annual report published by Transport Research Wing about road accidents in India 2015. India is one of the highest motorization growth rate countries in world, but now our country is facing serious impact of road safe levels. There is 2.5 per cent increased in road accidents from 4,89,400 in 2014 to 5,01,423 in 2015. Likewise total number of persons killed in road accidents increased by 4.6 per cent from 1,39,671 in 2014 to 1,46,133 in2015. Injuries also increased by 1.4 per cent from 4,93,474 in 2014 to 5,00,279 in 2015. The road accidents severity will be measured in terms of number of persons killed per 100 accidents increased from 28.5 in 2014 to 29.1 in 2015. The survey of road accidents in 2015 reveal that about 1,374 accidents and 400 deaths is takes place every day, which may further translates into 57 accidents and loss of 17 lives as average every hour in our country.

Road Accidents Parameters: 2014 and 2015			
Parameter	*2014*	*2015*	*%change over previous year*
Total Accidents in the country	4,89,400	5,01,423	2.5
Total number of persons killed in the country	1,39,671	1,46,133	4.6
Total number of persons Injured in the country	4,39,474	5,00,279	1.4
Accident Severity	28.5	29.1	2.1

Table2.1: Road accidents in 2014 and 2015

According to table 2.1 survey accident severity is increased by 2.1 per cent from 2014 to 2015. In 2014, 28.5 per cent accident severity is registered and in 2015 accident severity is increased to 29.1 per cent. From the analysis of survey registered in table 2.1 road accidents and severity is increasing year by year. Likewise the persons killed also increasing year by year.

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Year	Number of Accidents		Number of Persons		Accident Severity
	Total	*Fatal*	*Killed*	*Injured*	
2005	4,39,255	83,491	94,968	465,282	21.6
2006	4,60,920	93,917	105,749	496,481	22.9
2007	4,79,216	1,01,161	114,444	513,340	23.9
2008	4,84,704	1,06,591	119,860	523,193	24.7
2009	4,86,384	1,10,993	125,660	515,458	25.8
2010	4,99,628	1,19,558	134,513	527,512	26.9
2011	4,97,686	1,21,618	1,42,485	5,11,394	28.6
2012	4,90,383	1,23,093	1,38,258	5,09,667	28.2
2013	4,86,476	1,22,589	1,37,572	4,94,893	28.3
2014	4,89,400	1,25,828	1,39,671	4,93,474	28.5
2015	5,01,423	1,31,726	1,46,133	5,00,279	29.1

Table 2.2 :Number of Road Accidents and Number of Persons affected: 2005-2015

According to table 2.2 the total number of accidents and fatal accidents is increasing year by year. From 2005 to 2015 there is continuously increasing rate of accidents, fatal accidents, persons killed and injured persons also. Survey clearly shows the number of accidents and killed persons are increasing, if this continues then it will leads to sever problem in future.

3.BLOCK DIAGRAM:

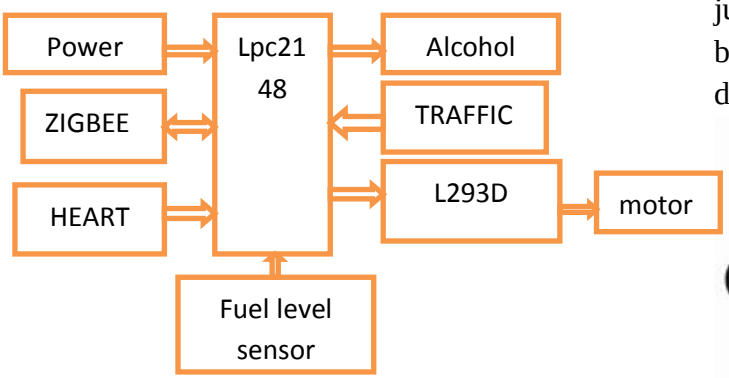

Fig: 3.1 Block Diagram

4.OVERVIEW OF BLOCK DIAGRAM

4.1) ARM7: ARM is the abbreviation of Advanced RISC Machines, it is the name of a class of processors, and is the name of a kind technology too. The RISC instruction set, and related decode mechanism are much simpler than those of Complex Instruction Set Computer (CISC) designs

Fig:4.1 ARM7 controller

4.2) **Heartbeat sensor**: the heartbeat sensor is used to check the drivers heartbeat rate. Heart rate data can be really useful whether you're designing an exercise routine, studying your activity or anxiety levels or just want your shirt to blink with your heart beat heartbeat sensor which will constantly detect the heartbeat rate of driver.

Fig 4.2: Hear Beat Sensor

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If the heartbeat rate goes to abnormal rate then the message will be send to owner, hospital and police using GSM or IoT.

4.3) Alcohol sensor: the alcohol sensor is fixed on the steering which will detect the alcohol level from the air breath out by driver, if in case it accuracy is not that much then just fix the alcohol sensor in the seat belt. There is a possibility to some other chance to get the smell of the alcohol, but by using our concept we can overcome those challenges. The Alcohol sensor will measure the level of alcohol constantly and send to PIC microcontroller, which check whether the driver drunk alcohol or not.

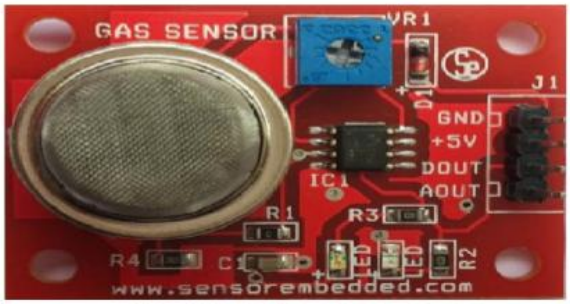

Fig:4.3 Alcohol Circuit Detection

4.4) Fuel Sensor Or Level Sensor: Level Sensor is used to check whether available fuel is sufficient to reach the destination. When driver starts the vehicle, Level sensor automatically calculates the fuel required based on the destination selected in the Google Maps. If the Fuel is lesser than required, then it automatically locates the nearby Petrol Station to fill up the fuel.

4.5) Zigbee: The Zigbee (802.15.4g) will detect signal and send the message to all receivers, which is present in cars. After receiving the message from traffic light Zigbee transmitter, then the PIC microcontroller will start executing the code, which was already coded in the circuit.

Fig:4.4 Zigbee Module

4.6 IoT: A wireless router is a device that performs the functions of a router and also includes the functions of a wireless access point. It is used to provide access to the Internet or a private computer network. It can function in a wired LAN (local area network), in a wireless-only LAN (WLAN), or in a mixed wired/wireless network, depending on the manufacturer and model.

5. RESULT:

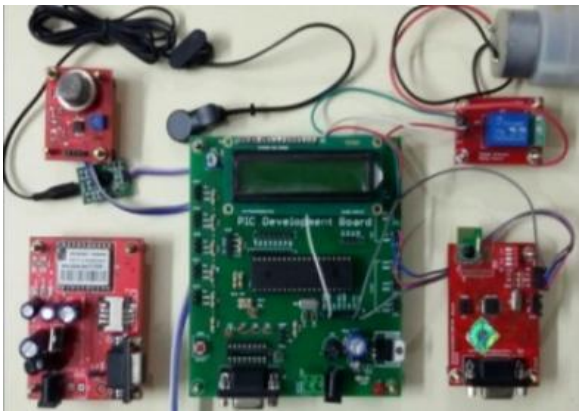

Fig:5 Hardware Implementation

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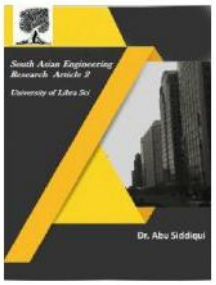

6.CONCLUSION AND FUTURE ENHANCEMENT:

In this paper we have proposed the smart car system using IoT, GSM and sensors like heartbeat sensor, Fuel level sensor, traffic light sensor and alcohol sensor for prevent the persons and driver travelling in the car from accident. We used "Prevention is better than cure" proverb which makes our life safe and secured. Like the proverb in this paper we described our concept which makes the drivers to follow the road rules to drive the car. Our Government asked drivers to follow the Traffic rules, but drivers refused to follow road rules like buckle up seatbelt, don't drink and drive vehicle, stop in red signal. If we implement the concept described in this modern world then surely there will be reduction in accidents.

If our concept is implemented in this real world, then the some more implementation is needed to make this paper completely useful to this world. We have to fix RFID tag for ambulances, fire engines, etc.., to make signals to detect there is some emergency, so if the RFID tag is detected by traffic signal then the signal will be change from the red to green. If the RFID tag is goes out of range then the signal will change again from green to red. But in this paper we have to make signals to communicate with each other to change from green to red when there is emergency detected in another sign al. Likewise in alcohol detection concept the message wants to be send to nearby car belongs to same owner and make that car's driver to pick up the passenger. In heartbeat concept the treatment for heart attack wants to be displayed to help driver, if there is passenger then it will be useful to driver as first aid.

A decade ago, Drivers suffered from Cardiac arrest due to continuous driving and stress inside them, which in turn they met with lots of accidents. Tension may be caused due to various factors such as personal reason, work pressure, etc., which leads to accident due to cardiac arrest. Stress may be increased due to continuous driving for 16-20 hours without any rest. We can overcome these problems/accidents with the help of our paper with the Heartbeat sensor. When driver wears the seat belt, Heartbeat sensor starts monitoring while driving and if any abnormal change in the heartbeat is found, then the vehicle gradually decreases the speed and will automatically stop the vehicle by initiating the Parking light. Until now, we cannot accurately measure the petrol level. This may lead to stop the vehicle before we reach the destination and we cannot reach on time. If petrol is empty, then we need search for the nearby petrol station during our journey time, which will waste our time in this fast moving world. By using our concept, we can measure the petrol level before we start our journey. This will save time, which helps us to reach our destination on time. If the petrol is not enough to reach the destination, then we can easily identify the nearby petrol station easily using Google Maps.

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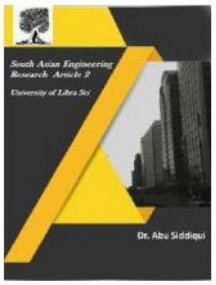

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