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ATDRED-HELMET: Accident, Theft, Drunk While Drive and Restricted Area Entry Detection HELMET

G.Kalyan
B.Tech,
Dept of ECE,
MRRITS, Udayagiri.

B.Bhuvan Chand
B.Tech,
Dept of ECE,
MRRITS, Udayagiri.

G.Kamal
B.Tech,
Dept of ECE,
MRRITS, Udayagiri.

Abstract:

Now a day's virtually most of the countries area unit forcing the motor riders to wear the helmet and to not use the vehicles once the person is in intoxicated condition and talking through mobiles throughout driving has been prohibited. however still in several places, the foundations area unit being profaned by the users. so as to beat these issues, Associate in Nursing intelligent system has been embedded within the helmet itself. The signal detected by IR device from the ear lobe region Associate in Nursingd an alcohol device are transmitted to the vehicle feedback circuit. it'll not activate the vehicle, once the user is while not helmet or in intoxicated condition. The system containing the GPS receiver can offer the geometric coordinates to the management unit. supported this coordinates the user cannot drive the vehicle into no entry or no parking areas.

If he enters into the restricted space, buzzer can get activated and vehicle speed additionally gets controlled. additionally to the on top of, once Associate in Nursing accident happens the system can begin alarm and if the user tries to suppress the warning alarm then SMS won't be sent else it'll be sent to the user's relatives/ friends. This contact info coded within the system also can be changed as per the users would like. throughout the stealing, this location of the vehicle is known by causation the message from the user to the intelligent incorporated system. By this manner the recovery of the vehicle is additionally attainable by GPS-GSM communication. For the dodging of use of mobile phones the speakers area unit hooked up to the system which might be accessed exploitation Blutooth.

Index Terms:

Accident, Drunken Driving, Helmet, Intelligent system, Safety, Sensor, Vehicle.

1. INTRODUCTION:

Now a day's road accident could be a major drawback everywhere the globe. The recent report says [1] that annual average of 700,000 road accidents, ten percentages occur in Asian country that has overtaken China. the newest annual statistics discovered by the globe Health organization (WHO) in its initial world standing report on road safety, 80,000 individuals ar killed on Indian roads attributable to rushing, boozy driving, less usage of helmets, seat belts and kid restraints in vehicles. Another latest report of National Crime Records Bureau or NCRB [2] says that forty individuals below the age of twenty five die in road accidents all round the world. It states that the boozy driving could be a major issue for the rising of death on roads. The drunk driving fatalities within the year 2009, until the twenty seventh Nov were eleven,769. The numbers for 2007 and 2008 were twelve,998 and 11,773 severally. It shows that the matter of drunk driving is way from over. within the 2009 DUI national statistics discharged by the NHTSA (National route Traffic Safety Administration) eleven,773 individuals died in alcohol-related crashes. Most of the accidents occur outside the cities ar attributable to boozy driving and no testing methodology is adopted to avoid these fatalities in highways. Motorists parking their vehicles in —No parking areas increase the speed of traffic within the metropolitan cities. In Indian road system, widening of the road isn't another resolution to avoid traffic in such a cities [3]. The Statistics of law breakers is represented below in Table1.

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2. EXISTING METHODOLOGY:

Sweat sensors [4], Saab Alco Key [5], straw like tube on the driver seat [6] are used to check drunken condition of the drivers in cars. But these devices lead to misreading, inaccurate testing and circuit complexity is high. Hongjie Leng and Yingzi Lin [7] developed a novel carbon nanotube (CNT)-based alcohol sensor with a particular focus on the response delay problem presented in CNT based sensors. William R. Reagen [8] developed a system for locating missing vehicles.

Shegeyuki Kojima et al designed a new algorithm to distinguish between the normal and intoxicated state of a person which is proposed as the basic theory of the sensing system. The entire solution requires only a mobile phone placed in vehicle and with accelerometer and orientation sensor. A program installed on the mobile phone computes accelerations based on sensor readings, and compares them with typical drunk driving patterns extracted from real driving tests.

Jiangpeng Dai et al focused on drunken driving, or officially driving under the Influence of alcohol, which is a major cause of traffic accidents throughout the world. Lei Wang et al [11] suggested that the integrity of PPG signal and accuracy of heart rate detection were evaluated and the results showed that with adequate optical shielding and the proposed passive motion cancellation, the device was able to reliably detect heart rate both during rest and moderate exercise.

Aditya et al [12] suggested that biometrics can be used in the security mechanism for the motor vehicles, as an anti theft device. Darnell et al [13] invention comprises a portable locating unit to provide location information signals. Heng et al [14] suggested compulsory helmet laws for bicyclists and expanding anti-drunk driving campaigns to target alcohol-intoxicated bicyclists.

Alex Tay et al [15] presented a path-planning algorithm and a novel global navigation strategy for autonomous unmanned ground vehicles in an unstructured terrain. It is able to chart a path along roadways and off-road terrain. From this review, each and every paper gives only a particular application to provide a safety to the drivers.

To overcome the major problems on road accidents and drunken driving, we designed an intelligent system in the vehicle to avoid drunken driving. In addition to this, we have adopted few more applications to avoid parking of vehicles in No parking/ No entry area the features incorporated in our system are

1) Confirmation of helmet wearing

2) Alcohol detection

3) No entry/ No parking indication

4) Accident intimation and

5) Theft detection

6) To avoid use of Mobile Phone during Driving

3. PROPOSED METHODOLOGY:

This paper mainly focuses on avoidance of drunken driving. Hence this system will not turn on the vehicle, when the user is in drunken condition. In addition to this, it will not allow the user to park/ drive the vehicle in the no parking or no en-try area respectively. The system will send short message ser-vice to the friends/ relatives when an accident occurs. It also employs theft detection. Our system consists of two major parts. They are

1) Helmet unit and

2) Vehicle unit as shown in fig.1 & 2.

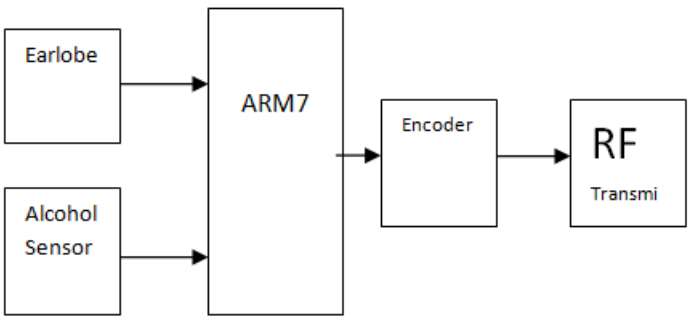

Fig 2.1 Block Diagram of the Transmitter

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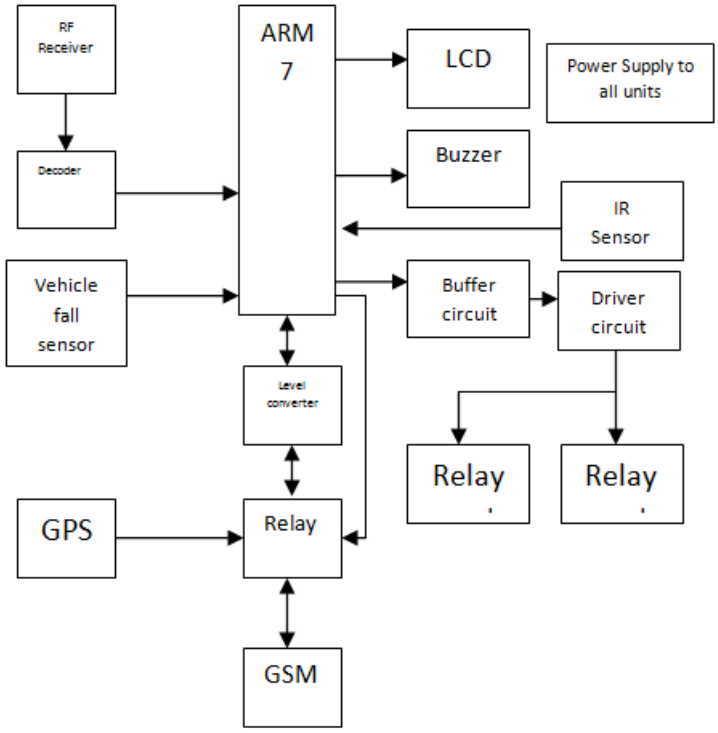

Fig 2.2 Block Diagram of the Receiver

3. 1 Helmet design- Earlobe:

The human earlobe is composed of tough earlobe and adipose connective tissues, lacking the firmness and elasticity of the rest of the pinna (the outer edge of the ear). Since the earlobe does not contain cartilage it has a large blood supply and may help to warm the ears and maintain balance. However, earlobes are not generally considered to have any major biological function. The earlobe contains many nerve endings, and for some people is an erogenous zone.

3. 2 Alcohol Sensor:

Description: This alcohol sensor is suitable for detecting alcohol concentration on your breath, just like your common breathalyzer. It has a high sensitivity and fast response time. Sensor provides an analog resistive output based on alcohol concentration. The drive circuit is very simple, all it needs is one resistor. A simple interface could be a 0-3.3V ADC.
Features:

- 5V DC or AC circuit
- Requires heater voltage
- Operation Temperature: -10 to 70 degrees C
- Heater consumption: less than 750mW

3.4 Confirmation of helmet wearing & alcohol detection :

MQ-3 gas sensor (alcohol sensor) is suitable for detecting alco-hol content from the breath. So it can be placed just below the face shield and above the additional face protection. The sur-face of the sensor is sensitve to various alcoholic concentra-tions. It detects the alcohol from the rider's breath; the resis-tance value drops leads to change in voltage (Temperature variation occurs).Generally the illegal consumption of alcohol during driving is 0.08mg/L as per the government act. But for demonstration purpose, we programmed the threshold limit as 0.04 mg/L. Threshold can be adjusted using variable resis-tor. Earlobe detector senses which is fitted with the helmet unit senses the blood flow in the earlobe region. So that the wearing of helmet is confirmed by our system and similarly alcohol sensor fitted in the mouth piece of the helmet detects the alcohol in the breath and sends the level of alcohol to the controller. If both of the criteria's are met in an acceptable manner then the two control signals are sent from the helmet unit to the vehicle control unit. The decoded RF signal is sent to the controller in the vehicle unit shown in fig. 2 to start / stop the vehicle. If the signal from the earlobe region and no control signal from alcohol sensor is detected then the vehicle will start, otherwise the vehicle will not start.

3.5 No entry/No parking indication:

The Global Positioning System (GPS) is a space-based global navigation satellite system that provides reliable location and time information in all weather and at all times and anywhere on or near the Earth. For each and every location in the world, the coordinates are unique. Co-ordinates are measured using GPS receiver which consists of an antenna array. Our system uses GPS for accident detection and theft detection applications. For our system convenience, we have considered some locations as —No entry & No parking area in our college is depicted in the fig.3. After placing the receiver in a particular position where we need to take co-ordinates, the satellite be-gins transmitting a long, digital pattern called a pseudo-random code.

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The receiver begins running the same digital pattern. When the satellite's signal reaches the receiver, its transmission of the pattern will lag a bit behind the receiver's playing of the pattern. The length of the delay is equal to the signal's travel time. The receiver multiplies this time by the speed of light to determine how far the signal is traveled. In order to make this measurement, the receiver and satellite clocks need to be synchronized down to the nanosecond. To make a satellite positioning system using only synchronized clocks, you would need to have atomic clocks not only on all the satellites, but also in the receiver side.

Thus every satellite contains an expensive atomic clock, but the receiver itself uses an ordinary quartz clock, which it constantly resets. Co-ordinates vary for every 6 feet, but there is no much difference between them. Hence we have considered a particular dis-tance of about 24feet in each road periodically and the co-ordinates are measured. The following tables represent the GPS Readings taken in our college campus for the —No entry & No parking area.

3.6 Accident intimation & Theft detection:

GSM is used in the case of accident detection and theft de tection application. In case of any accident the alarm will get activated, if the rider is in conscious stage he would suppress the alarm; if not a short message service will be sent to the friend's mobile number. Various mobile numbers can be programmed in the microcontroller.GSM and GPS do not communicate directly with each other. Microcontroller acts as an intermediate between them. To know the location of the vehicle soon after the theft, rider has to send an SMS to the modem present in the vehicle unit. GSM set up in the vehicle unit consists of subscribers identity module (SIM) whereby it rece ives the SMS and communicates with GPS regarding the cur-rent location of the vehicle position and sends the message to the pre defined mobile number(s) programmed in the micro-controller. For the detection of accident, the sensor is attached to the body of the vehicle. When the vehicle meets any crash-es, the buzzer will get activated due to activation / damage of the sensor. If the rider is in conscious condition, he/ she can suppress the buzzer. Otherwise the message will be sent to the friends/relatives continuously till the help reaches the rid-er.The overall performance of the system is shown in fig. 3.

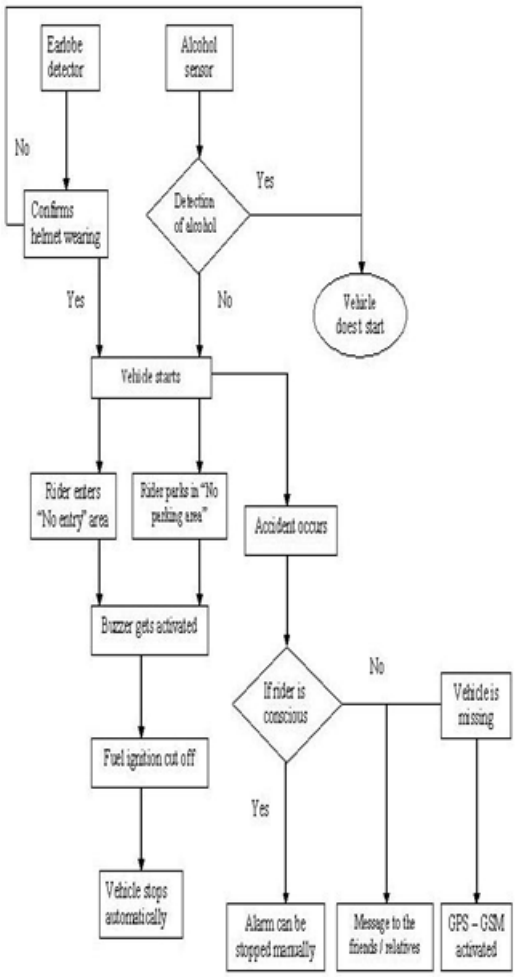
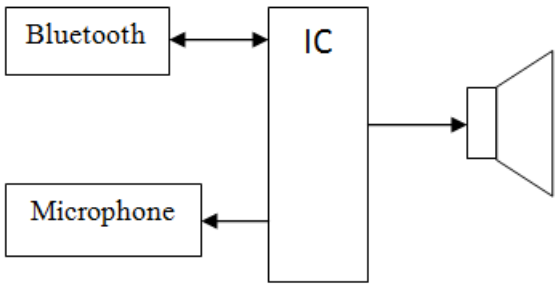


Fig-3 Overall performance of the system

3.7 To avoid use of Mobile Phone during Driving:

For the avoidance of use of mobile phones the speakers are attached to the system which can be accessed using Blutooth



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4. CONCLUSION & FUTURE WORK:

Our system efficiently checks the wearing of helmet and drunken driving. By implementing this system a safe two wheeler journey is possible which would decrease the head injuries during accidents and also reduce the accident rate due to drunken driving. This system also indicates No parking area which would reduce the crowd of the vehicle in those areas. No entry area is mainly allocated during the construc-tion or repairing of the road, if the rider enters in such area this system would immediately intimate as —No entry area and vehicle will stop automatically.

In case of any accident it would send the messages to the friends continuously about the location of the accident happened till the first aid reaches the rider. Our system helps to know the location of the vehicle for rescuing in the case of theft incidents.In future we planned to fabricate our intelligent system in a compact size and as well as globally acceptable to notify the No entry and No parking areas. Government must enforce laws to install such system in every two wheeler. By imple-menting such mechanism in two wheelers, the deaths due to drunken driving and other road fatalities can be brought to zero percent.

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ABOUT AUTHOR'S:

1.G.KALYAN: He got his Engineering graduation from J.N.T.University. Now, he is doing his research at HN Global Solutions, Hyderabad. He is doing his Research work under the guidance of Mr. K.venkateswarlu and esteemed guidance of Dr.Channa Reddy, Head of the Department of Electronics and Communication of Engineering,MRRITS.

2.B.BHUVAN CHAND: He got his Engineering graduation from J.N.T.University. Now, he is doing his research at HN Global Solutions, Hyderabad. He is doing his Research work under the guidance of Mr. K.venkateswarlu and esteemed guidance of Dr.Channa Reddy, Head of the Department of Electronics and Communication of Engineering, MRRITS.

3. G.KAMAL: He got his Engineering graduation from J.N.T.University. Now, he is doing his research at HN Global Solutions, Hyderabad. He is doing his Research work under the guidance of Mr. K.venkateswarlu and esteemed guidance of Dr.Channa Reddy, Head of the Department of Electronics and Communication of Engineering,MRRITS.