



EFFICIENT ACCIDENT AVOIDING AND ADVANCED IDENTIFICATION SYSTEM

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ABSTRACT:

Drowsy is the reason for most of the road accidents. Manually tracing the drowsy driver is not an easy task, because every day thousands of vehicles are running on the roads. So we need a system that must come with every car and if it detects the sleepy driver it must stop the vehicle immediately. If any of these sensors senses an abnormal condition of the driver, the vehicle automatically slows down and stops. A buzzer is placed in the vehicle which alerts the surrounding vehicles or the passengers inside the vehicle. At the same time an SMS alert consisting of the location and condition of the driver is sent to the registered mobile number.

KEYWORDS: Drowsiness, Arduino-uno, Driver, SMS, BUZZER, GPS

INTRODUCTION:

"Drowsiness" is a state of strong desire for sleep or may cause due to illness. Sometimes high alcohol content in the body causes the wrong kind of sleepiness. Drowsiness is one of the reasons for most of the road accidents. These accidents are most common late at night and early in the morning. This is the body's natural sleep period. Accidents due to drowsy driver most often occur at high speeds on highways and other major roadways. Oftentimes, in this case at least one vehicle may change its direction suddenly which may lead to an accident situation. Heartbeat, respiration rate & the body status of the driver are the most important factors to be considered for a safe driving. This system expects to reduce the number of accidents caused by drunken driving, which is very essential element for a prosperous life tomorrow. It alerts the driver and the surroundings with which we can save many lives. Driver drowsiness detection is a car safety technology which helps prevent accidents caused by the driver getting drowsy. Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads. Some of the current systems learn driver patterns and can detect when a driver is becoming drowsy. The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because

of the hazard that drowsiness presents on the road, methods need to be developed for counteracting its affects. The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the eye blink rate, heart-beat respiration rate and temperature of the driver. In this project we use sensors to measure all these factors. The values measured will be sent to the microcontroller where the measured values will be compared with the reference values. If the values measured do not match with the reference values then the microcontroller will send a warning sign in the LCD display thereby preventing accidents. Driver drowsiness is one of the main reasons for the accidents. About 50% of the accidents are road accidents. The drowsiness of the driver has become a major cause for the road accidents. Some methods need to be developed to prevent the driver from his drowsiness during driving. This has become a major challenge to develop a system for the prevention of this issue. In earlier systems, visual analysis of eye state and head pose (HP) for continuous monitoring of alertness of a vehicle driver were used [1]. The Raspberry pi camera and Raspberry pi 3 module were used to calculate the level of drowsiness in driver [2]. A module for Advanced Driver Assistance System

(ADAS) was presented to reduce the number of accidents due to driver fatigue thus the visual information and artificial intelligence were used [3]. Researchers have attempted to determine driver drowsiness using the following measures: (1) vehicle-based measures; (2) behavioral measures and (3) physiological measures [4]. The aim of this paper is to develop a prototype of driver drowsiness detection system. This system mainly focuses on monitoring of the driver's body temperature and eye blink rate. It also monitors the heart beat rate of the driver. These factors are measured using the appropriate sensors. The microcontroller compares the sensor values with the reference values provided. It alerts the driver if these values are out of the reference value range. Additionally, the GSM module sends the message to the concerned people to notify about the driver. Automotive population is increasing exponentially in the country. The biggest problem regarding the increased traffic is the raise in number of road accidents. Road accidents are undoubtedly a global menace in our country.

LITERATURE SURVEY:

The proposed system in [4] deals with an automatic accident detection system involving vehicles which sends information about the accident including the location, the time and angle of the accident to a rescue team like a first aid center and the police station. This information is sent in the form of an alert message. But in the cases where there are no casualties a switch is provided which can be turned off by the driver to terminate sending the alert message. A GSM module is used to send the alert message and a GPS module is used to detect the location of the accident. The GPS and GSM module are interfaced to the control unit using serial communication [5]. The accident itself is detected using two sensors- Micro Electro Mechanical System (MEMS) sensor and vibration sensor. MEMS sensor also helps in measuring the angle of roll over of the car. The proposed system in [9] aims at reducing the loss of lives due to traffic accidents and performs three main tasks – (1) detecting an accident and sending the location to the nearest hospital, (2) controlling traffic light signals in the route taken by the ambulance [10] [11] and (3) monitoring vital parameters of the patient inside the ambulance itself and sending this information to the hospital. These three tasks are achieved by the working of four units into which the system is divided: The vehicle unit: This unit consists of a microcontroller, sensors, GPS, GSM module and an accelerometer. The sensors detect the accident, the GPS gets the location and the GSM module conveys this information to the main server unit. The accelerometer can help avoid

accidents by notifying the driver when the position of the vehicle is deviated from the normal. The entire vehicle unit must be installed in the vehicle. The control unit: This unit contains the database of hospitals and is responsible for communicating messages between all the units. The ambulance unit: This unit has a patient monitoring system to constantly measure and convey the patient's temperature and pulse rate to the hospital. The traffic junction unit: This unit turns the signal to green when the ambulance is about 10 meters away so that the path is clear for it to move quickly. This is achieved through RF communication. Thus, this system has overcome many drawbacks of the existing accident detection systems with respect to time. The proposed system in [12] is in the form of an Android application which detects an accident using an accelerometer which is built in the smartphone. The phone must be docked inside the vehicle and not held by any person. The working of this application is as follows: When the device is tilted above a certain threshold and is detected by the accelerometer, the application waits for 15 seconds. Here, three kinds of input can be received. (1) If the user is active, he can press "cancel" if the device was tilted by mistake. (2) If the user is active, he can press "send" if an accident has occurred. (3) If the user is inactive and no button is pressed after 15 seconds, an accident is assumed to have occurred. In case of (2) and (3), the current location is fetched by GPS and a pre-recorded voice message along with the location is sent to the 108 ambulance emergency response service. A study on GPS services provided by Android has been thoroughly conducted [13] [14]. Thus, through the use of just a smartphone without any extra hardware components, efficient accident detection and notification has been achieved. The proposed system in [15] also uses an Android application where the smartphone must be placed in a holder attached to the vehicle. The Accident Detection Algorithm detects an accident based on three kinds of events: (1) A collision is detected if the accelerometer shows a reading above the threshold which is $4g$ ($g=9.8m/s^2$) and the approximate severity of the accident is determined by a metric called Acceleration Severity Index (ASI). (2) Rollovers are detected using a gyroscope and a magnetometer. If a rotation greater than 45 degrees occurs and if the instantaneous speed is found to be less than 5km/h, it is considered as a rollover. (3) And airbag deployed signal indicates an accident as well. If one of these three events is detected, an alert is sent through three different sources - a Decentralized Environmental Notification Message (DENM) message containing a Road Hazard Warning, by performing an e-Call to an

Emergency Medical System (EMS) and finally by SMS.

PROPOSED TECHNIQUE:

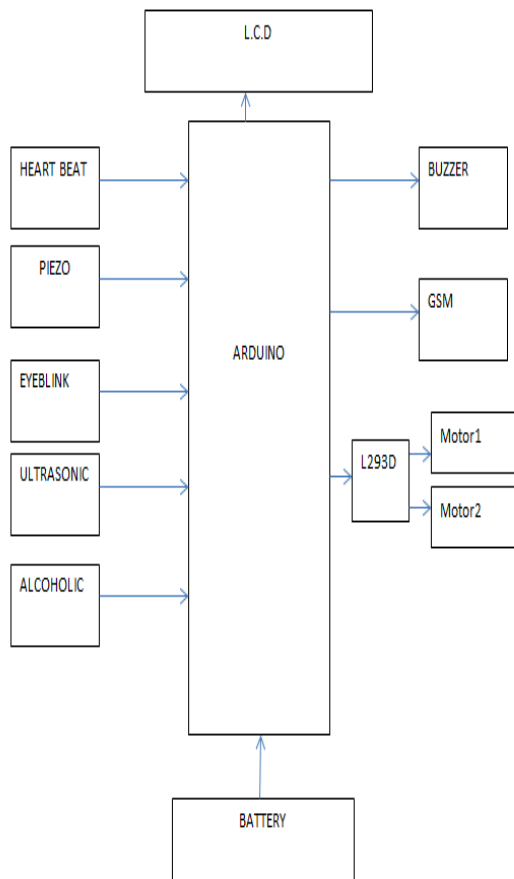
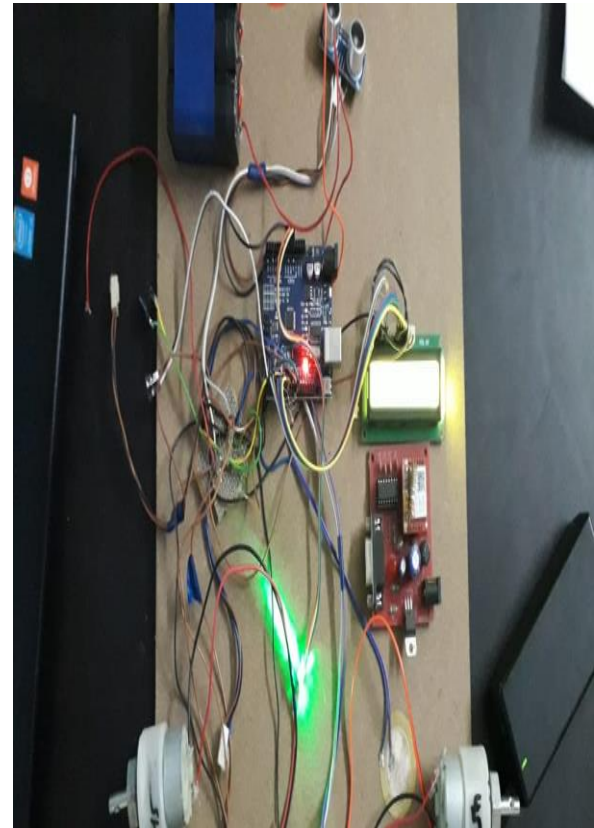


Fig: Proposed Technique

Driver Fatigue is often caused by four main factors: sleep, work, time of day, and physical. Often people try to do much in a day and they lose precious sleep due to this. Often by taking caffeine or other stimulants people continue to stay awake. The lack of sleep builds up over a number of days and the next thing that happens is the body finally collapses and The person falls asleep. Time of day factors can often affect the body. The human brain is trained to think there are times the body should be asleep. These are often associated with seeing the sunrise and sunset. Between the hours of 2 AM and 6 AM, the brain tells the body it should be asleep. Measurement of different parameters of the driver such as Heartbeat, Body temperature and Eye blink using the sensors like Heart Beat sensor, Body Temperature sensor and Eye Blink Sensor respectively. Monitoring the health status of the driver using sensors like Heartbeat, temperature sensor. Driver drowsiness detection is a

car safety technology which helps prevent accidents caused by the driver getting drowsy. Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads.

RESULT:



CONCLUSION:

Although no vehicles can be entirely secure or no accident can be avoided, this system tries to lessen the possibility of those. The design and implementation of vehicle tracking system in real time system providing the location of the vehicle and accident is described in this paper. As the sensors in the car detect a collision it sends the data to the receiver. The predefined program written in the ARM does all the work of controlling and processing incoming signals and taking necessary actions. The message will be sent to ambulance, police station and all the pre-install numbers using the GSM module with sensor values. Implementation of this system has a very low cost. This project provides a vague idea of how we can extract parameters of accident and help can be provided to the victims. It also defines the importance of the accident detection system, its working and its use to save the precious life

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