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Instant Automobile Crash Recognition System

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Abstract

Accidents are a major issue that we face on a daily basis on the streets and highways. The percentage of accidents is rapidly increasing due to overcrowding, and some are due to drunk driving and driver drowsiness. In this project an instant car crash Recognition system with additional characteristics such as drowsiness detection, alcohol sensing and fire accidents sensing systems for vehicles are introduced, which gives a higher chance of reducing road accidents on a daily basis and simultaneously the system locates its geographic location when there is an accident. A system based on a microcontroller was designed using Global Positioning Systems (GPS) and Global Mobile Communication System (GSM). When a vehicle is hit by another obstacle, the physical strength is collected from the car as the push button input, it is turned on and the accident alert will be sent to the desired person. The pushbutton helps you to recognize a road crash and send data to the microcontroller. In addition, when an accident occurs, the GPS will locate the geographical co-ordinates for that specific location and send a message using the GSM. This allows people in danger to survive with the assistance of the local aid agencies. The system is cheap and user-friendly

Keywords: *microcontroller,accident detection,drowsines,alcoholsensor,firesensor,pushbutton,GPS,GSM.*

I.INTRODUCTION:

Motivation of the project:

In terms of road traffic, India is one of the world's most occupied countries. In recent years, the automotive industry in the entire country has become the fourth largest in the world. Nearly 90 percent of the nation's passenger transport and about 65 percent of goods was carried by the Indian road network spanning five million kilometers. As the number of vehicles increased rapidly and Indian road safety was so relentlessly congested, it became a major factor for the citizens in the country[1]. In India there are an average of 1214 road crashes every day. 25 percent of the total road accidents occurred on two wheelers. Approximately 1.3 million people die every year from traffic crashes, according to the WHO. We developed a crash recognition system with necessary functionalities to protect the lives of millions of people suffering from road accidents.

Implementation of the project:

In this desired prototype, the microcontroller is interfaced with different sensors like ultrasonic ,IR ,alcohol and fire sensors . The main purpose of the project is to identify the accident and send an alert message, while the accident location will also be sent to the desired by GPS and GSM. In addition, some functionalities are

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incorporated to improve the reliability of this Prototype .sensors which are implanted in this system are used to perform required task in the vehicle. when a person driving a vehicle, if the driver closes his/her eyes for two to three times then the IR sensor will detect that the driver feels drowsy and sleepy then it will give its response to the micro controller then it will activate the buzzer to required time duration and give alertness to the driver. If he is not able to react for proper alert then it will stop the vehicle. the system is designed in such a way that if the alcohol sensor detects that the person has alcohol concentration in his breathe then it automatically shutdown the engine. the ultra sonic sensor is used to alert the driver when the back coming vehicle comes near to it.

II.LITERATURE SURVEY

A good research has been done on accident prevention and detection on previously implemented systems. This system can accurately send messages to the confined mobile phones as per the functionality of GSM in the program. The magnetic sensing element notices the space between vehicles when this value is more than the defined value then sends message by the usage of Arduino and GSM modules. A buzzer is implanted in this model, which is used to alert the driver and a lcd to bear in mind of the people inside the vehicle regarding the danger. This will increase chance to reduce accidents [2].

This system helps to track and determine every automotive that adopts a global positioning system and GSM technology[4]. The movement and quality of every vehicle can be monitored accordingly with the bundled system. The GSM modem and GPS receiver interact with a microcontroller to manage, drive and manage.. The instructions are processed with a set of instructions and serve as a partner between GSM and the global positioning system.

In this model, the system features an online system called 'Eye Blink and Head Movement Watching System,' which allows drivers to alert them somnolently. The principle of continuously monitoring the driver's eye movements with an IR sensing element and head movements with the accelerometer is the basis for this procedure. If he/she falls asleep, then he/she may be awakened by an alarm[5].

In this method, it briefly describes the somnolence of the driver and psychological and biomechanical patterns that allow the somnolence cycle to be characterized and its stages to be detected by new technologies. The vehicle has been recorded in a driving simulator in physical indicators, eye closure, longitudinal and lateral control[8]. This model presents a laboratory experiment with a non-driving device, with a threefold objective: (a) assembly information from medical signals and performance and eye and therefore body movements from drivers, in each wakeful and slumping situation. This is a laboratory experiment conducted in a driving machine, with a (b) outline, as recommended in the literature for a variable supported by EEG and PERCLOS to classify the phases of sleepiness[8].

In this system, a cost-effective solution is presented for reducing road crashes and providing necessary health care. The system consists of an eye-blink sensor system, an accident location tracking system, an alcohol detector and a safe monitoring and control system. It detects drowsiness and sends the driver an alarm signal. Even after the alarm, the vehicle's brake mechanism continued to operate and further movement was limited[7].

In our proposed model we are developing an accident recognition system using microcontroller which is interfaced with so many sensors that are likely to be drowsiness sensor, GPS & GSM module, fire sensor and LCD display including an alcohol sensor. This developed system will be able to detect the automobile crash with the activation of push button and instantly send the emergency message and location of the spot to the registered mobile number with the help of GPS and GSM. Numerous sensors are interfaced with the microcontroller then it will take the whole control over all the sensors incorporated in it. Each sensor performs specific tasks in this system, namely the detection of drowsiness The IR sensor will detect

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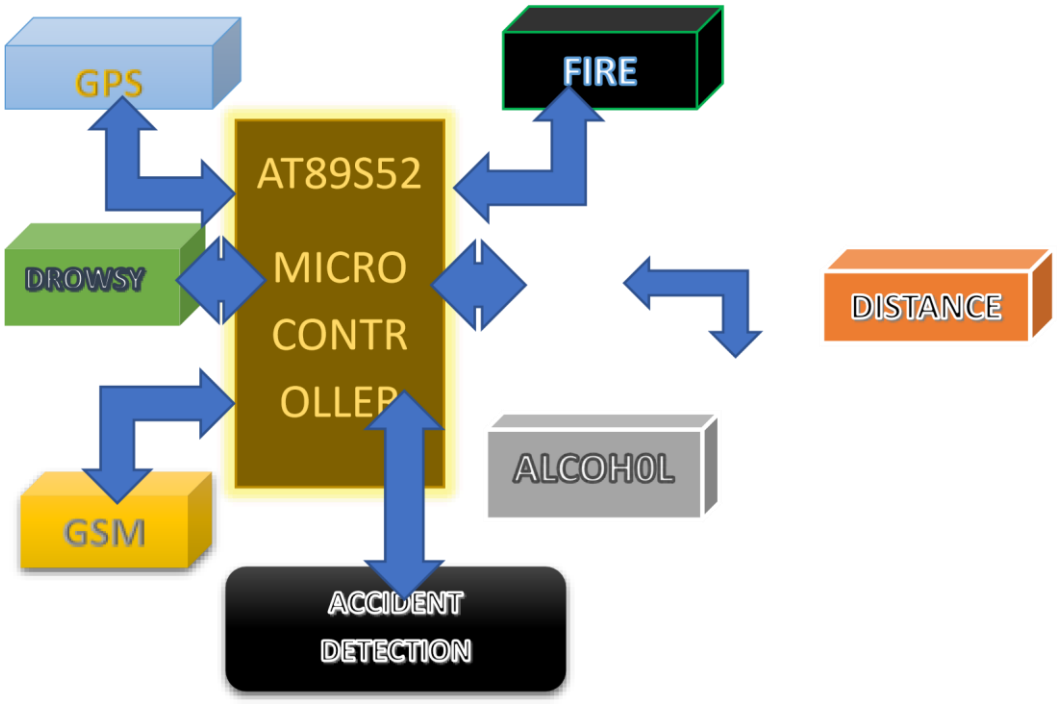
and alert the conductor through buzzer if the driver feels drowsy. Even if the driver could not react after the buzzer, the vehicle will stop moving. After the alcoholic content is detected in your breath, the alcohol sensor is activated, which then reduces the vehicle's movement automatically. Ultrasonic sensor is used to alert the driver if any vehicle comes near to it from the backside.The dumped programming part in the microcontroller will instruct all these controls. Hence all this applications and functionalities makes this system different from all other previous developed projects.

III.BLOCK DIAGRAM:



IV.FLOWCHART

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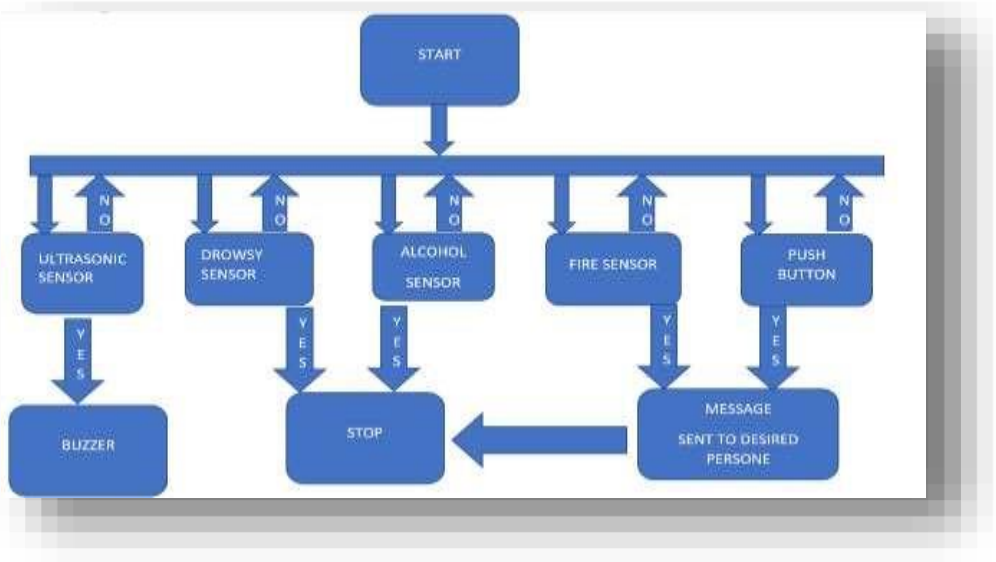

IV.REQUIREMENTS

Hardware:

1.DC Motor

Fig.1

The DC motor as shown in the fig.1 is used to give the moment to the robot. Based on our requirement speed of this dc motor will be adjustable.

2.LCD Display

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Fig.2

The LCD Display as shown above are commonly used in many projects, due its cheap price, availability and user friendly. In this proposed method LCD (16x2) is used to display the desired outputs. 3.GSM Module

Fig.3

GSM Module is used to transmit a message to a registered number as indicated above (fig.3). The GSM module will send the message to predefined numbers when the Accident Sensor or Fire Sensor has been activated.

4.GPS Module

Fig.4

The GPS module as shown in the fig.4 is used to locate the global position of the vehicle. It has rechargeable battery for backup and separated 18x18mm GPS Antenna. The operating temperature of this module is from -40 to 85 c.

5.Ultrasonic Sensor

Fig.5

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The Ultrasonic sensor which helps to find the distance from other vehicles. It will alert the driver when any other vehicles come closer to it. The detectable range of distance is from 0.02 to 4.0M. The output level will be up to 5V.

6.Drowsiness Detector

Fig.6

The drowsiness detector as shown in the above Fig.6 will used to alert the driver whenever the driver closes his eyes. At first when the driver feels sleepy or close his eyes it will sounds the buzzer two times if not respond then the vehicle will be automatically stop.

7.Fire Detector

Fig.7

This sensor is activated and sends the message to the predefined mobile number using GSM module. The fire sensor will be activated as shown in Fig.7 when the car is hit. The operating voltage is between 3.3 and 5V. 8.Alcohol Sensor

Fig.8

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The alcohol sensor as shown in the above fig is used to detect whether the driver is alcoholic or not. If driver is alcoholic the vehicle will automatically stop. This sensor is very high sensitivity to alcohol and power supply range is from 4 to 5V.

9.AT89S52 MICROCONTROLLER

Fig.9

The Microcontroller as shown in the fig.9 which belongs to 8051 family. It will help to perform all activities in this project. Generally, microcontroller operations is depends on code dumped in it. It contains three 16Bit internal RAM's and its clock speed is up to 33Mhz. The AT89S52 Microcontroller is has 32 programmable I/O lines and 8 interrupt sources.

V.EXPERIMENTAL RESULTS:

After connecting all the required components and specific functional sensors on the prototype.it is been tested for its functional failures. After proper functioning of all the sensor parts. it is been interfaced with the AT89S52 microcontroller which belongs to 8051 family through the assembler programming which is dumped through code dumper. The experimental working of our prototype can be seen through fig .10

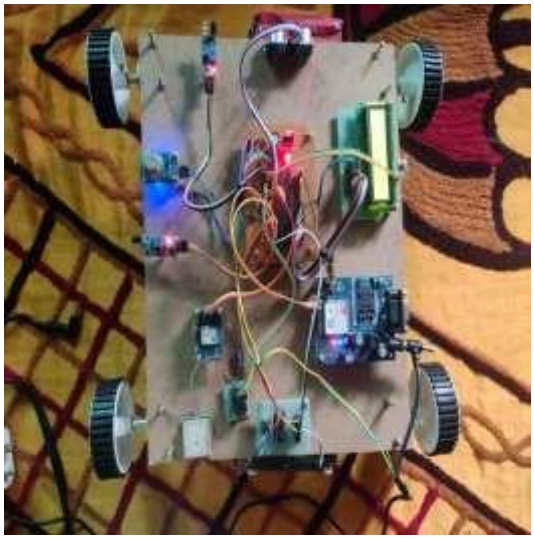

Fig.10

The main motto of this prototype is achieved when the push button is activated.

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VI.CONCLUSION:

The prototype Instant Automobile Crash Recognition System using microcontroller with multiple functionalities which majorly based on accident detection and tracking has successfully developed and implemented. The developed system was working properly and produces the required output. The expected performance is successfully achieved with this developed system. It is more cost efficient than any other accident detection system. All sensors which are used to perform specific function in the vehicle are working effectively . it can be directly implanted in any required position in the vehicle.

VII.FUTURE SCOPE:

The system may in future interface with an airbag deployment system, which prevents damage to interior objects such as the steering wheel or the window lenses by the passengers of the vehicle. In this proposed system, seat belt indication may also be used if the driver has not been aware of it. Minimum speed crossing indications, with more than limited speed during driving. The speed limit specification can be selected and implanted into this system. The interconnection of a camera to the controller module can also be achieved by taking photos of surrounding vehicles which make finding the vehicle that hit them easier.

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