Vehicle With Advanced Safety System Using AT89S51

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Abstract- *This document gives basic idea of the project" VEHICLE WITH ADVANCED SAFETY SYSTEM USING AT89S51"and the literature survey done in accordance to that. This system represents a new design of a vehicle with advanced security systems using AT89S51 microcontroller. This system is designed to avoid the casualties that are caused in road accidents using various sensors integrated within the system.*

The shock sensor detects the accident. The gas sensor detects gas leakage, fire sensor detects fire, alcohol sensor detects alcohol and hence the message will be displayed on the LCD display panel. So, now we have developed a automobile which will be installed with different sensors like gas sensor, fire sensor, alcohol detector sensor, and shock sensor, if the car meets with an accident then the message will be sent to the registered numbers in the directory.

Also fingerprint module is installed to make sure that only authorised personnel get access to the automobile

This paper represents the passive safety of vehicles created so as to increase the efficiency and decrease accidents and casualties.

Keywords- Microcontroller 89S51, Smart Vehicle, Sensors, Safety Features

I. INTRODUCTION

Passive safety features-Passive safety features are the ones that come into picture when the car crash has already occurred. Like passive safety features, there are other features called as active features which work differently than the passive safety features. The passive features are to sustain the damage after the car crash whereas the active features are the ones that are trying to avoid the car crash.

The vehicles that are seen today in the twentieth century are having this term called as life space. This life space is nothing but the area around the driver within which he or she can escape the car crash with minimum injuries. So, basically what passive safety features do is it just makes sure that the driver is in this life space when the car crashes. Crumple zones are the adsorbents, which absorb the shock before it could reach the passengers in the car. Similarly, there are other such examples of passive features like seat belts, airbags and headrests which helps to keep the passengers to stay within the car crash at the time of impact. That why if a car has such safety features the passengers can escape out of the car crash with minimum damage.

They are outside the life space is however more vulnerable to serious injuries, for example, if the drivers forget to wear his seat belt the at the time of car crash if the impact is to hard then it is possible that he or she might crash into the windshield or other hard parts of the vehicle. Sometime when the impact is too hard, the driver can also be ejected from the car breaking the glass.

These features might be called as passive features but when it comes to safety they play equally important role in saving the human life. And because of this very reason these features are being modified every now and then. For example, now-a-days new vehicles have installed airbags not in in the steering wheel but all around the knee caps. So at the time of accident the driver is kept safe within the life space. Sometimes even seat belts can cause injuries to a person if it is to tight, so advanced seat belts are now being installed into automobiles with moderate adjustable settings. Even headrests can include passive safety technology in order to reduce the risk of whiplash.

Active safety features-Active safety features are those that help to prevent or mitigate road crashes. Unlike passive safety features – which are designed to protect vehicle occupants once a crash has occurred active safety features are trying to avoid the car crash, so that no losses are tolerated.

In many ways these active safety features can help to avoid car crash. Few of them could be the alarming system whenever the car get too close to another object or say line departure warning systems. Other safety features like electronic stability control, anti-lock braking systems, and brake assist monitor the vehicle's tires and brake systems for any signs that tailored braking is necessary in order to avoid a collision. some of the other active safety features act as fail-safe features, which active when two functions are pressed simultaneously. For example, if brake and accelerator

are pressed together then the vehicle will go in lock down mode and the vehicle will stop functioning temporarily.
The one thing which is common in all the active safety features is that, they all are constantly monitoring the vehicle for any hazardous situations. These actives features are continuously checking the aspects of vehicles that are the speed of vehicle, the number of rotations of the tyres, the fuel level and many more. when some problem is detected, the active safety features are activated automatically

These features act as a added safety coating to the driver. But at the same time one should not completely rely on these features

II. EVOLUTION

The first vehicles that were launched were no exactly very safe and all, so it was not a surprise that as soon that the vehicles were launched the Americans started getting killed. Before the era of 20th century there were already thousands on vehicles on the road. These number hiked up to a five-digit number in the late 10's and 50,000 in 1970's.

In the hands of an expert driver also, an automobile can become a fast, bulky projectile. So, when derived by a drunk idiot, it will certainly increase the number of causalities. So, besides the driving education and all still we need to launch some devices that can add to safety of the drivers.

Most of the features were very effective even though they came late. The signals that we use to indicate which direction we will be heading towards were introduced by Buick in 1937. The seat belts were first launched by Tucker in 1948 when he did and experiment in his car, these seatbelts became more common in 50's and 60's of 19th century. As the installation of seatbelts saved many lives so they were made compulsory by the automobile industry in all the automobiles. In similar fashion in 1989 the airbags were made compulsory in all automobile, as if saved around 30,000 lives in 1 year.

Like we say, every coin has two sides, similarly not all the invention that were invented were successful, many of them were huge failures In fact, many were pathetic, if not dangerous. One of them was the 1907 O'Leary Fender, a sort of mesh cow-catcher (or, human catcher) which bolted to the front of your vehicle and was meant to shovel pesky pedestrians aside.

III. LITERATURE SURVEY

1. ‘Improvement of road safety using passive and active intelligent vehicle safety system’ dated on 10 September 2007.

According to this case study, the number of accidents have been raised significantly, so it was necessary to launch new safety features in automobile industry which are active and passive safety features

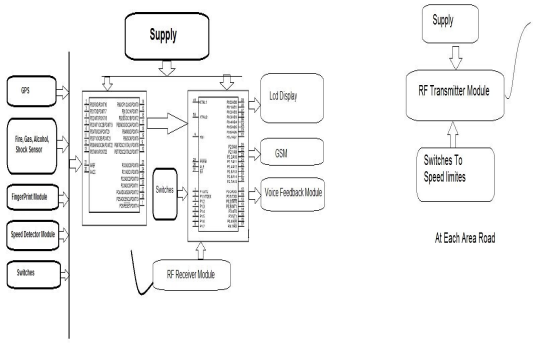
2. ‘Enhancement of active and passive safety features for future pre-safe® systems’ dated 2002

New safety features were installed for the driver’s safety so that no harm comes to the driver, these were more advanced features.

IV. BRIEF SKETCH

The following block diagram shows a brief sketch of the system. It consists of the following basic blocks:

1) Micro-controller 89S51
2) ATMega 328P
3) Sensors-Gas, Shock, Fire, Alcohol
4) LCD Display, LED’s
5) Finger Print Module
6) Voice Feedback module
7) GPS and GSM Module
8) RF Transmitter and Receiver
9) Switches, Alarms



Basically, the Micro-controller and the ATMega 328P both the IC’s are interfaced with together. So, whenever the sensors installed on ATMega 328P sense fire, alcohol, Shock, Gas they immediately send a signal to the microcontroller. The micro-controller then manages other modules like GSM module and sends a message to the victim’s registered number about the incident and location so that help can arrive as soon as possible. Also finger print

module is connected to the chip, so that only authorized personal can have access to the vehicle.

Microcontroller AT89S51

AT89S51 is a higher performance 8-bit microcontroller .it has 4Kb of inbuilt Flash Memory that can be reprogrammed .it is manufactured using Atmel's technology and compatible with industrial and factory standards of 8051 instruction set and layout. It provides highly flexibility and cost effectiveness to many industrial applications.

Sensors

Gas Sensors been a sensitive material senses the presence of gas that exist in the air, higher the gas concentration higher the conductivity. Fire sensor detects the presence of fire and heat in the surrounding. Also shock sensor detects the sudden change in the force acting on an area and accordingly detects it. Alcohol sensor detects the presence of alcoholic material or breath.

GSM Modem

It is necessary to reduce the time span between the accidents occurs and when the paramedics team are dispatched to the scene. To fulfil this requirement GSM modem SIM 300 is selected. GSM modem is a wireless modem that works with a GSM wireless network. It is used to detect traffic accidents & immediately notify to authorized person after the accident. GSM modem has low power consumption of 0.25A during normal operations and around 1A during transmission. Operating Voltage for GSM is 7 – 15V AC or DC. Its operating baud rate is 9600bps. GSM normally have 3 waves GSM 900, DCS 1800 and PCS1900.

GPS Module

The GPS is very helpful in Automatic Vehicle Location system using GPS for positioning information and to transmit the information to the authorized person. GPS module have lot of features some of them are:

Gaining the vehicle's location information (latitude· longitude) after specific interval of time. This will be helpful to trace the vehicle in case of accidents and rush the injured to the nearest hospital in the Rush Hour which can save many lives.

The objective of the project is to build an additional feature to the present security system that will warn the owner of the vehicle by alarming him through SMS when there has been an intrusion into the vehicle.

V. ADVANTAGES

1) Low cost: - As the price of Micro-controller is quite economical the overall cost of the project is very low.

2) Easy to install: - It can be easily installed into any vehicle. Depending upon the size of vehicle the length of wires can be altered.

3) Easy to maintain: - The hardware used is economical therefore the maintenance cost is also very less.

4) Multipurpose: - It can be used for various reasons like for safety purposes as well as for anti-theft measures

VI. CONCLUSION

Safety Features along the road plays an important role but at the same time the safety features within the features are crucial too as they ensure the safety of the passengers traveling in.

If many instruments are equipped in a high-speed vehicle to provide more than necessary information to the driver they will draw the driver to pay attention to these instruments and furthermore he needs to learn how to operate these instruments.

Diversion, fatigue are two fatal factors in the car accidents. The main task of our study is in coordinating with the information provided from the system and if accident happens to reduce the time as well as damage to the least level.

After accident is detected, short alarm massage data will be sent via GSM network. Sensors work accordingly and gives the respective output. If the temperature increases than the threshold level the motor stops automatically.

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