Mcep Based Intelligent Vehicle With Multitask Management

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---*Abstract*---

Many of the survey report about vehicle accident say that, accidents are happening due to driver's drowsiness and over speed. Drunk and driving is another factor for accidents. If these mistakes are corrected accidents can be reduced, not hundred percent but up to the satisfied level. If accidents occurred, immediate first aid and treatment is necessary to save life. So once accident happened informing it immediately to nearby hospital and ambulance service is very important. But if there is no neighbor the case may be severe. Keeping all these in mind a new idea is proposed which can perform the necessary steps to prevent accident. It can prevent the accidents and incase if accident happened system will inform the owner and ambulance about this accident. The alcohol sensor available in the proposed system alerts the owner such that "Drunk and Driving" and it will not allow engine to start. In case alcohol consumption is sensed at the time of driving, engine will slowly OFF after giving pre-warning sound. Steering wheel grip sensor is used to detect driver's drowsiness and alert the diver not to sleep. Finally when accidents occurred, the system will automatically send a text message to ambulance service via GSM network. The system also records the parameters like speed and engine temperature in permanent storage during the time of accident. It helps to identify the reason for accidents. Temperature sensor is used to detect the engine temperature and LCD screen displays the system's status. MEMS accelerometer is used to detect the accident, and during this accident speed is recorded in permanent memory for later reference.

I.   Introduction

1.1 An Overview of Existing System:

One of the greatest threats to your safety is not in the workplace, but rather on the road. Someone is injured every 18 seconds. Over 2 million of those injuries turn out to be disabling. A person dies in a crash on U.S. roads every 11 minutes. In fact, motor vehicle accidents are the

Most common cause of death in the United States-more than cancer or heart attacks. When we think about the serious accident, it could change your life - and not for the better. As of now most of the research and implementation on with mechanicalbehaviour of the car, its safety and passengers, but what if the driver misbehaviors what can be done?

Each year, car enthusiasts salivate at the prospect of seeing what bleeding-edge designs automakers will unveil on the car show circuit[1]. Those same enthusiasts are often disappointed when the amazing concepts still haven't made it to the auto dealer's showroom floor several years later. But before any new car model can ever go on sale to the public, it must first undergo a battery of testing to make sure it'll be safe, reliable and reasonably in tune with the demands of the motoring public. The government demands some of this testing, while other major components of it are devised by the car companies themselves in an effort to ensure they meet specific standards for performance, fuel economy, comfort and other measures, but those which don't are axed.
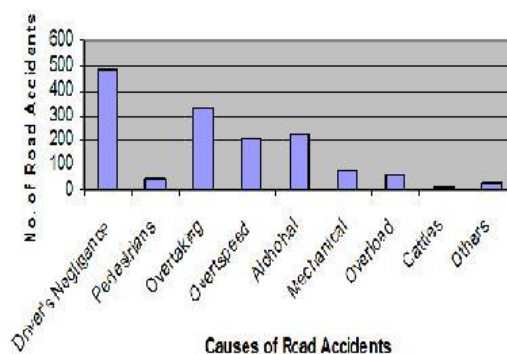

Causes of Road Accidents

Fig.1.1 Causes of Road Accidents [5]

By observing above chart we are able to conclude that there are three dominant causes of Road accidents- Negligence, Overtaking, Use of alcohols are related to driver. The main reason for driving drunk is that the police are not able to check each and every car and even if they catch any one the police can be easily bribed. So there is a need for an effective system to check drunken drivers.

1.2 PROPOSED SYSTEM:
Intelligent systems are in used with every aspect of systems, CARs are the critical systems which are real time and lives are involved. This System not only deals with component monitoring, does even more than that like Passenger activity monitoring, Behavior analysis, System behavior, Notification & co-ordinate.

Eye blink Sensor & Alcohol detection are the vital and of great importance from the perspective of passenger safety and traffic safety. Impact detection and notification is also one of the life saving and critical information provider system.

II. Vision-Based Intelligent Vehicle
Research Worldwide
Although the first research efforts on developing intelligent vehicles were seen in Japan in the 70's, significant research activities were triggered in Europe in the late 80s and early 90s. MITI, Nissan and Fujitsu pioneered the research in this area by joining forces in the project "Personal Vehicle System" [2]. In 1996, the Advanced Cruise-Assist Highway System Research Association (AHSRA) was established among automobile industries and a large number of research centers [3]. In the US, great deals of initiatives have been launched to address this problem. In 1995, the US government established the National Automated Highway System Consortium (NAHSC) [4], and launched the Intelligent Vehicle Initiative (IVI) in 1997. Several promising prototype vehicles/systems have been investigated and demonstrated within the last 15 years [6].

III. The Advanced System Design
3.1 ABS (Anti-Locking Braking System):
ABS works with your regular braking system by automatically pumping them. In vehicles not equipped with ABS, the driver has to manually pump the brakes to prevent wheel lockup. In vehicles equipped with ABS, your foot should remain firmly planted on the brake pedal, while ABS pumps the brakes for you so you can concentrate on steering to safety.

3.2 EBD (Electronic brake-force istribution):
Electronic brake-force distribution (EBD or EBFD), Electronic brake-force limitation (EBL) is an automobile brake technology that automatically varies the amount of force applied to each of a vehicle's brakes, based on road conditions, speed, loading, etc. always coupled with anti-lock braking systems.

3.3 SRS Air Bags (Supplemental Restraint System Air Bags)
An airbag is a vehicle safety device. It is an occupant restraint consisting of a flexible envelope designed to inflate rapidly during an automobile collision, to prevent occupants from striking interior objects such as the steering wheel or a window, the sensors may deploy one or more airbags in an impact zone at variable rates based on the type and severity of impact; the airbag is designed to only inflate in moderate to severe frontal crashes.

3.4 Immobilizer:
An immobilizer is an electronic device fitted to an automobile which prevents the engine from running unless the correct key (or other token) is present. This prevents the car from being "hot-wired" after entry has been achieved.

3.5 Parking Sensors:
Parking sensors are proximity sensors for road vehicles which can alert the driver to unseen obstacles during parking man oeuvres. Parking

Sensors generally fall into two categories.
i) Electromagnetic parking sensors,
ii) Ultrasonic parking sensors.

3.6 Cruise Control:

Cruise control (sometimes known as speed control or auto cruise) is a system that automatically controls the speed of a motor vehicle. The system takes over the throttle of the car to maintain a steady speed as set by the driver.
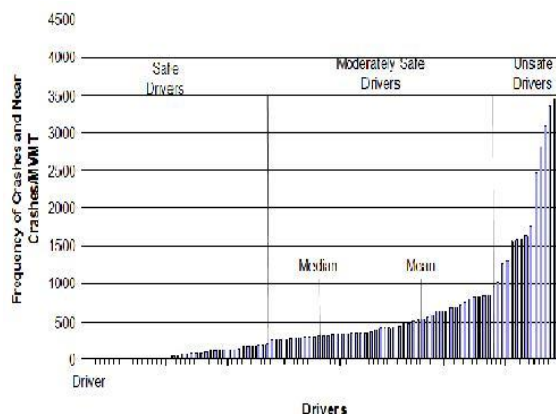
3.7 Existing System And Its Drawback:

Fig.3.1 100 Car Study Results [5]

IV.   Existing System Block Diagram:-

After doing the observation of number of accidents we cleared that frequency of crashes is because of unsafe drivers. Driving under the influence of alcohol or drugs, which is responsible for about one-third of all road accidents. Every year people are injured or killed on the road because another driver was driving under the influence. Defensive drivers never drink nor take drugs and drive. They understand that alcohol and drugs impair your- Ability to determine distances, Reaction time, Judgment and vision.

None of this above detects Driver or Passenger mis behavior.
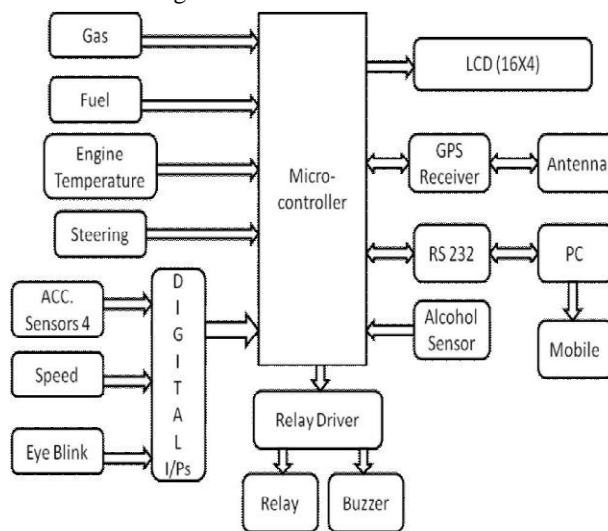
Existing System Block Diagram (CAR Unit).

4.1 Hardware Description

The heart of system is MICROCONTROLLER which will access the data. In our project we will use 'ARM' controller.To measure temperature of car there will be a temperature sensor.

To convert the output of sensor into electrical form we will use signalconditioning (transducer). As controller operates only on digital data, so this analog data is to be converted into digital form by using ADC. But ADC is inbuilt in ARM processor. So the output of the signal conditioner circuit is directly connected to ARM processor. Similarly LPG gas sensor isconnected to PIC using conditioner circuit.
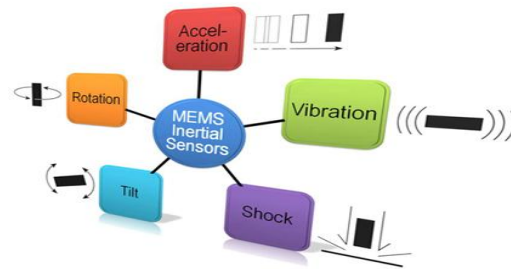
Fig 4.2:-operation of mems

Micro machined accelerometer is used to measure the axis of the plane where the vehicle is positioned and lock the microcontroller.If any displacement happens microcontroller activates the alarm.
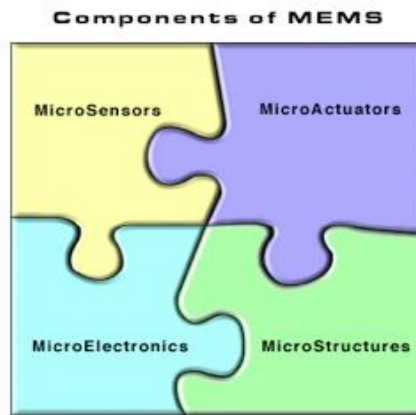

Fig4.1.1:-different forms of mems

4.2 Breath Analyzers

It is used to detect the alcohol content in the driver's breath .If the percentage is crossed over a safe limit the ABS system is activated and an SMS will be sent to the owner of the vehicle via GSM mobile circuit.
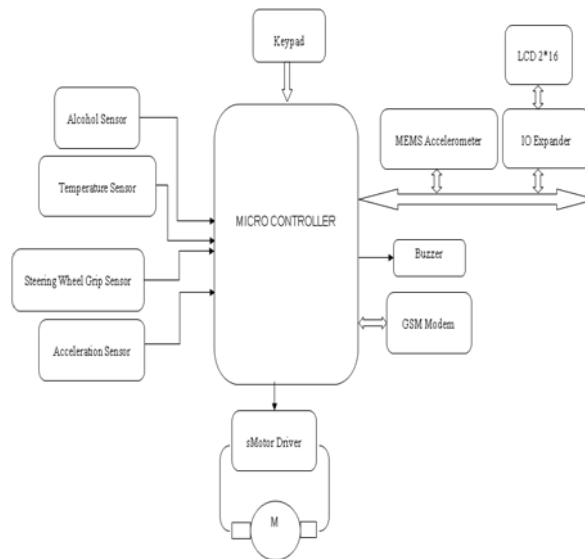
V. Steering Wheelgrip Sensors

Fig 5:-steering grip sensors

It is used to detect the driver's fatigues by determining the sweat in the palm and also activates the required system to safely park the vehicle and intimate the nearby emergency vehicle based on the Base Station of the GSM coverage.

VI.   Potential Proposed System

6.1 Interfacing of Gsm with Controller

Dial command D:
Syntax   : ATD+91xxxxxxxxxx;
Answer a call A:
Syntax   : ATA
Send message +CMGS:
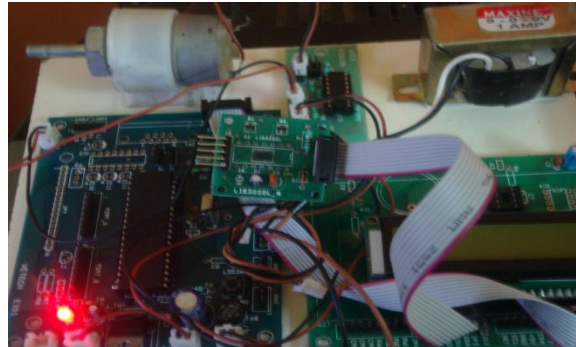Syntax   : AT+CMGS="+91mobile number"
                  [Message Content]
                  < CTRL+Z >

6.2 Advantages of Proposed System

a. Provides high level safety to human life
b. Suitable for Indian conditions
c. Easy retrieval of data for the cause of incidents through black box.
d. low cost and less complex system for installing and application.

6.3 SIMULATION RESULT
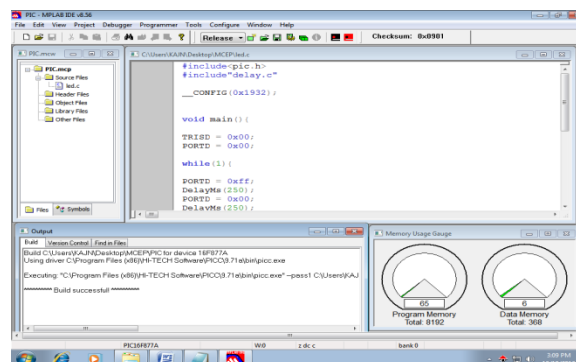
6.4 PROTYPE DESIGN

VII. Conclussion

It is due to the driver's fatigue, traffic accidents keep with a yearly increasing of a high rate. This paper shows the new fatigue detection algorithms & techniques using eye blink, alcohol, impact, gas, etc. sensors. In this technique the fatigue will be detected immediately and regular traps the events driver and third party. Through research presented in this paper, we propose an intelligent car system for accident prevention and making the worlda much better and safe place to live.

Acknowledgement

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