Automatic car control during heart attack with an emergency messaging and comprehensive health monitoring system

R. Punitha, G. Suchithra, A. Sujitha

Abstract--Traffic accidents are one of the leading causes of fatalities.Accident due to drowsy is prevented and controlled when the vehicle is out of control. And also the drunken drive also prevented by installing alcohol detector in the vehicle. The term used here for the recognition that the driver is drowsy is by using eye blink of the driver. In recent times drowsiness is one of the major causes for highway accidents. These types of accidents occurred due to drowsy and driver cant able to control the vehicle, when he/she wakes.The drowsiness is identified by the eye blink closure and blinking frequency through infra-red sensor worn by driver by means of spectacles frame. The alcohol consumption is also verified during the starting process of the vehicle using alcohol detector. If the driver is drunk then the buzzer indicates and the vehicle doesn't allow the driver to start the vehicle. Health parameters {heart rate,blood glucose level,body temperature} are also continuously monitored. When an anomaly is found in the above parameters, the car fails to start and gives a warning indication. In this paper, we describe a real-time online safety prototype that controls the vehicle speed under driver fatigue. The purpose of such a model is to advance a system to detect fatigue symptoms in drivers and control the speed of vehicle to avoid accidents. The main components of the system consist of number of real time sensors like gas, eye blink, alcohol, fuel, impact sensors and a software interface with GPS and Google Maps APIs for location.

Index terms—Accidents, alcohol, drowsiness, heart -beat, infra-red sensor, GPS, software interface.

1 INTRODUCTION

Vehicle accidents are most common if the driving is inadequate.These happen on most factors if the driver is drowsy or if he is alcoholic or if he is physically ill. Driver drowsiness is recognized as an important factor in the vehicle accidents. It was demonstrated thatdriving performance deteriorates with increased drowsiness with resulting crashes constituting more than 20% of allvehicle accidents.When an auto crash occurs suddenly, the reaction of the emergency services now becomes a race between life and death.But the life lost once cannot be re- winded. Advanced technology offers some hope avoid these up to some extent. This project involves measure and controls the eye blink using IR sensor.

- *Miss. R. Punitha is currently working as an Assistant Professor in Electronics and Communication Engineering at SNS College of Engineering, Coimbatore, Tamil Nadu, India. PH. +91 97919 70897. E-mail: punitha.ece.snsce@gmail.com.*
- *Miss G. Suchithra is currently pursuing Bachelors program in Electronics and Communication Engineering at SNS College of Engineering, Coimbatore, Tamil Nadu, India. PH. +91 87546 09075. E-mail: suchi6594@gmail.com.*
- *Miss A. Sujitha is currently pursuing Bachelors program in Electronics And Communication Engineering at SNS College of Engineering, Coimbatore, Tamil Nadu, India. PH. +91 96295 51782. E-mail: sujithapruthiv@gmail.com*

The IR transmitter is usedto transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If theeye is closed means the output of IR receiver is high otherwise the IR receiver output is low.This project involvescontrolling accident due to unconscious through Eye blink and due to drunken drive through alcohol sensor.

By observing the chart below we are able to conclude that there are three dominant causes of road accidents 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.

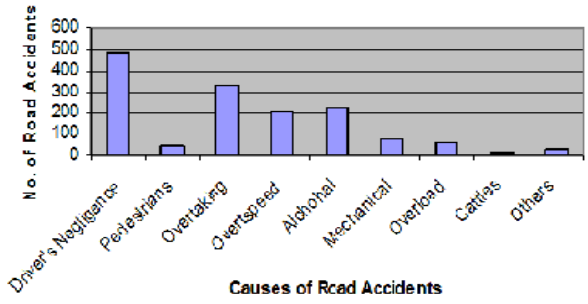

Fig.1 Causes of Road Accidents

2 IMPORTANCE OF EXISTING SYSTEMS

Driving while either intoxicated or drunk is dangerous and drivers with high blood alcohol content or concentration (BAC) are at greatly increased risk of car

accidents, highway injuries and vehicular deaths. Every single injury and death caused by drunk driving is totally preventable. At present drunken drivers have increased enormously and so is the deaths due to drunken drivers. The mail 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.

Each year, car enthusiasts salivate at the prospect of seeing what bleeding-edge designs automakers will unveil on the car show circuit 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. Those same 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.

3 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.

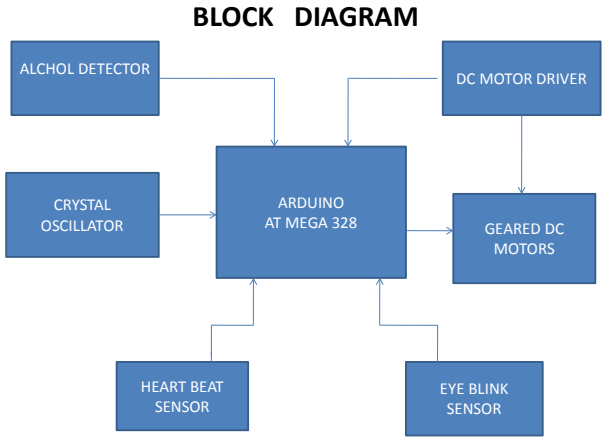

Fig. 2: Block Diagram

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 lifesaving and critical information provider system.

4 THE EXISTING ADVANCE SYSTEM FOUND IN HIGH END CARS

4.1 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.

4.2 EBD (Electronic brake-force distribution)

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.

4.3 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.

4.4 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.

4.5Parking 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

4.6 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.

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5 BLOCK DIAGRAM

5.1Basic model of the system

The block diagram depicts the total blue print of the proposed project. The total essence and the functioning of the project are represented in a single block diagram. The block diagram mainly consists of 5 parts. They include

- LM358 Comparator
- Eye Blink Sensor(IR)
- Heart Beat Sensor
- Alcohol Sensor
- 8 bit Atmel AVR Microcontroller
- GSM Module

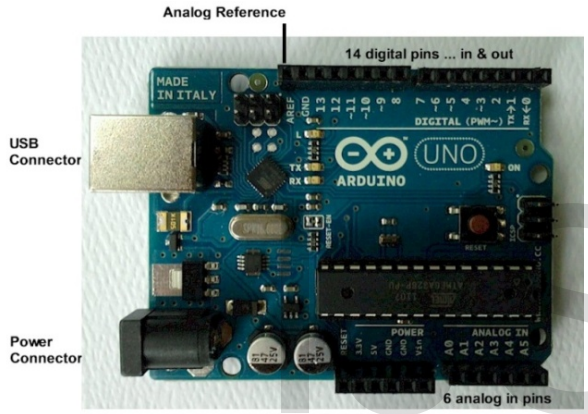

Fig.3: Arduino controller board

5.2Controller Board

An Arduino board consists of an Atmel 8-bit AVR microcontroller with complementary components to facilitate programming and incorporation into other circuits. An important aspect of the Arduino is the standard way that connectors are exposed, allowing the CPU board to be connected to a variety of interchangeable add-on modules known as shields. Some shields communicate with the Arduino board directly over various pins, but many shields are individually addressable via an I²C serial bus, allowing many shields to be stacked and used in parallel. Official Arduinos have used the megaAVR series of chips, specifically the ATmega8, ATmega168, ATmega328, ATmega1280, and ATmega2560. A handful of other processors have been used by Arduino compatibles. Most boards include a 5 volt linear regulator and a 16 MHz crystal oscillator (or ceramic resonator in some variants), although some designs such as the Lily Pad run at 8 MHz and dispense with the onboard voltage regulator due to specific form-factor restrictions. An Arduino's microcontroller is also pre-programmed with a boot loader that simplifies uploading of programs to the on-chip flash memory, compared with other devices that typically need an external programmer. This makes using an Arduino more straightforward by allowing the use of an ordinary computer as the programmer.

At a conceptual level, when using the Arduino software stack, all boards are programmed over an RS-232 serial connection, but the way this is implemented varies by hardware version. Serial Arduino boards contain a level shifter circuit to convert between RS-232-level and TTL-level signals. Current Arduino boards are programmed via USB, implemented using USB-to-serial adapter chips such as the FTDI FT232. Some variants, such as the Arduino Mini and the unofficial Boarduino, use a detachable USB-to-serial adapter board or cable, Bluetooth or other methods. (When used with traditional microcontroller tools instead of the Arduino IDE, standard AVR ISP programming is used.)

The Arduino board exposes most of the microcontroller's I/O pins for use by other circuits. The Diecimila, Duemilanove, and current Uno provide 14 digital I/O pins, six of which can produce pulse-width modulated signals, and six analog inputs. These pins are on the top of the board, via female 0.10-inch (2.5 mm) headers. Several plug-in application shields are also commercially available.

5.2 Benefits

1. Intelligent systems are in used with every aspect of systems, CARs are the critical systems which are real time and lives are involved.

2. This System not only deals with component monitoring, does even more than that.

a. Passenger activity monitoring

b. Behavior analysis.

c. System behavior.

d. Notification & co-ordinate.

3. Eye blink Sensor & Alcohol detection are the vital and of great importance from the perspective of passenger safety and traffic safety.

4. Impact detection and notification is also one of the lifesaving and critical information provider system .

6 Conclusion

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 world a much better and safe place to live.

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