



Drunken Driver Detection & Alarming System with Automated Braking System

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Abstract:

The demand for creating the accident alarm indicator is as high as the number of accidents is very high and it is safer compared to another device. In today's roads, drunken drivers or drowsy drivers is an important factor in the increasing number of accidents. This type of accidents leads to many fatalities and severe injuries. Therefore, a countermeasure device has to be used to prevent such type of road accident. An alcohol detector is used to detect the alcohol content of driver. In case the driver consumed alcohol, the ignition system shut off when the driver tries to start the vehicle. Next main device is eye blink detector which is used to detect the drowsiness of the driver. When driver sleeps, the eye blink detector detect and the system will generate warning signals to alert the driver. To avoid collision of vehicle, an automated pneumatic brake system is used. An Automatic Pneumatic Brake System applies the brake to stop the vehicle when the driver doesn't wake up on that warning alarm. This project can generate a model which can prevent such accidents.

Keywords: Drowsiness, Eye Detection, Alcohol Sensor, Microcontroller, Pneumatic Brake System, IR Sensor.

I. INTRODUCTION

Now a day's accidents are mainly due to the driver's in-alertness. Cost efficient and efficient Live Eye system has been developed which is reliable and highly accurate in monitoring the driver's attention [1]. To develop a system that track and localize the eyes and head movement of the driver. A warning signal will be given in the form of buzzer or alarm, when the eyes will be closed for too long [2]. By using GPS and GSM technology we can track the exact location of the accidental vehicle. If the vehicle met with an accident due to drowsy or alcohol consumption, then automatically GSM will send the SMS to police or owner himself [3]. Rajasekar et al. [4] proposed a system to avoid various road accident caused by drowsy driving and also used for a driver's security purpose to caution the driver if any gas leakage or fire accident. Wasan et al. [5] proposed a system of an algorithm to detect driver fatigue, which consist of two main detection system which includes driving fatigue detection from eyes movement and driving fatigue detection from driving behavior. Praveenkumar et al. [6] implemented a system to detect fatigue symptoms in drivers and control the speed of the vehicle to avoid accident. Measure and controls through alcohol sensor and eye blink using IR sensor. Ashish Rai et al. [7] Future enhancement can be made into proposed system by devising software algorithms, hardware implantation and interfacing sensors. Solutions for drink and drive cases, emergency speed control of vehicles, rash driving by obstructing spark plug, wheel grip using gravity sensor, preventing accidents, detecting accidents using impact sensor. And also transfer global photos by using GPRS in ARM 11 device and mailing it to required people. Vinukumar Luckose et al. [8] used a drowsy detecting alarming system and also used vibration system to keep driver active while driving. And also

concentrating on the braking of the vehicle to avoid hitting another vehicle. Kushal et al. [9] proposed a system of automatically braking the vehicle using pneumatic brake system to avoid front end collision of the vehicle along with the extension of bumper. IR sensor placed in the bumper is used to scan the surroundings during driving to avoid accident. From the above research, they implemented an eye blink detector and alcohol detector to avoid accident of drowsy driver and drunken driver. In our project, we use two types of sensors to avoid major mishap. MQ3 sensor is used as an alcohol detector to sense the alcohol content of driver and an IR sensor is used to monitor the eyes state. If the driver consumes alcohol, the vehicle locks ignition system and not able to start. If the driver sleeps due to drowsy condition, IR sensor sense the position of the eye and gives warning signal to alert the driver. When the driver not response to the warning signal, an automated pneumatic brake system is used to stop the vehicle within a distance. By using pneumatic brake system to avoid hitting the object or another vehicle which comes at the front and back.

II. THEORY

MICROCONTROLLER

Microcontrollers differ from a microprocessor in many ways, first and the most important is its functionality. In order for a microprocessor to be used, other components for receiving and sending data must be added to it, In short that means that microprocessor is the very heart of the computer. On the other hand, microcontroller is designed to be all of that in one, No other external components are needed for its application because all necessary peripherals are already built into, thus, we save the time and space needed to construct device. In addition, it contains inbuilt ROM, RAM I/O devices, Timers/Counters. One

or two instructions to move data between memory and CPU Powerful Boolean processor instruction set is available. Less access time for inbuilt memory and I/O devices. Requires less hardware, reduced PCB size and increased reliability. Less Flexible. Separate memory Map for data and code. More pins are multifunctional.

ALCOHOL SENSOR

Here MQ3 alcohol sensor is used. The MQ3 –Sensor will senses the alcohol content from the human breathe and gives the value to micro controller. The MQ3 is useful for detecting alcohol. An alcohol detector of MQ3 sensor is shown in the fig1.1. Then the fig1.2 can explain the function of alcohol sensor and ignition ON/OFF.

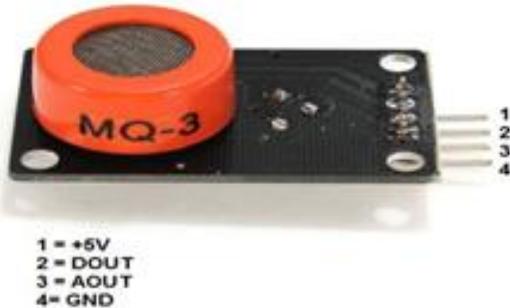


Figure.1. Alcohol Sensor

- ✓ A semiconductor sensor for alcohol detection.
- ✓ Has very good sensitivity and faster response of alcohol.
- ✓ Suitable for detecting alcohol concentration in breath, like a common breathalyzer.
- ✓ Provides an analog resistive output based on alcohol concentration.

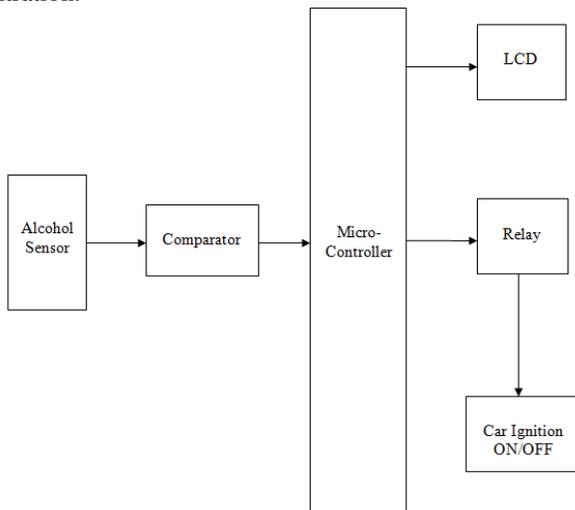


Figure.2. Block Diagram of Alcohol Sensor

IR BASED EYE BLINK SENSOR

IR Sensor is an electronic device that emits an infrared rays. This eye blink sensor is IR based. The IR sensor is fixed in driving glass in fig1.3. The variation across the eye will vary as per eye blink. If the eye is closed means the output is high otherwise output is low. This to know the eye is in closing or in opening position. This output is given to logic circuit to indicate the alarm. This can be used for project involves controlling accident due to unconscious through eye blink.



Figure.3. IR Based Eye Blink Sensor

SCOPE:

We can't take care of ours while in running by less conscious. If we will do all the vehicle with automated security system that provides high security to driver, also gives alarm.

Buzzer

A buzzer or beeper is an audio signaling device, which may be mechanical, electromechanical, or piezoelectric. Typical uses of buzzers and beepers include alarm devices, timers and confirmation of user input such as a mouse click or keystroke.



Figure.4. Buzzer

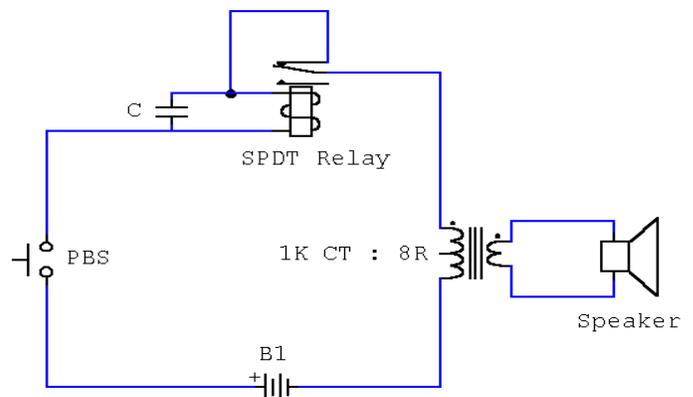


Figure.5. Circuit Diagram of Buzzer

This novel buzzer circuit uses a relay in series with a small audio transformer and speaker. When the switch is pressed, the relay will operate via the transformer primary and closed relay contact. As soon as the relay operates the normally closed contact will open, removing power from the relay, the contacts close and the sequence repeats, all very quickly...so fast that the pulse of current causes fluctuations in the transformer primary, and hence secondary. The speakers tone is thus proportional to relay operating frequency. The capacitor C can be used to "tune"

the note. The nominal value is 0.001uF, increasing capacitance lowers the buzzers tone.

III. PNEUMATIC DISC BRAKE

An air brake, or more formally a compressed air brake system or also pneumatic brake system, is a type of friction brake for vehicles in which compressed air pressing a piston is used to apply the pressure to the brake pad needed to stop the vehicle. George Westinghouse first developed air brakes for use in railway service. He patented a safer air brake on March 5, 1872. Westinghouse made numerous attractions to improve his air pressed brake invention, which led to various forms of the automatic brake. In the early 20th century, after its advantages were proven in railway use, it was adopted by manufactures of trucks and heavy load vehicles. A compressed air brake system is divided into a supply system and a control system. The supply system compresses, stores and supplies high-pressure air to the control system, then control system moves the piston forward, the brake pad attached with the piston touches the disc which is attaches in wheel rod. So, the friction produced in the disc and

that friction slowdown the speed of the vehicle. An experimental setup of pneumatic brake system is shown in the fig1.6.

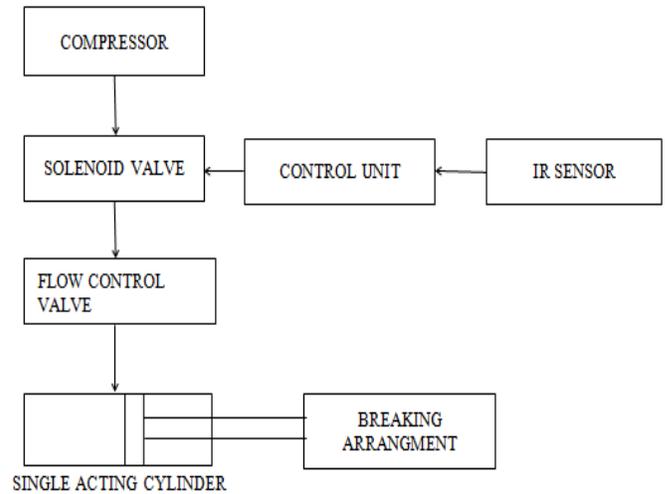


Figure.6. Block diagram of Pneumatic Brake System

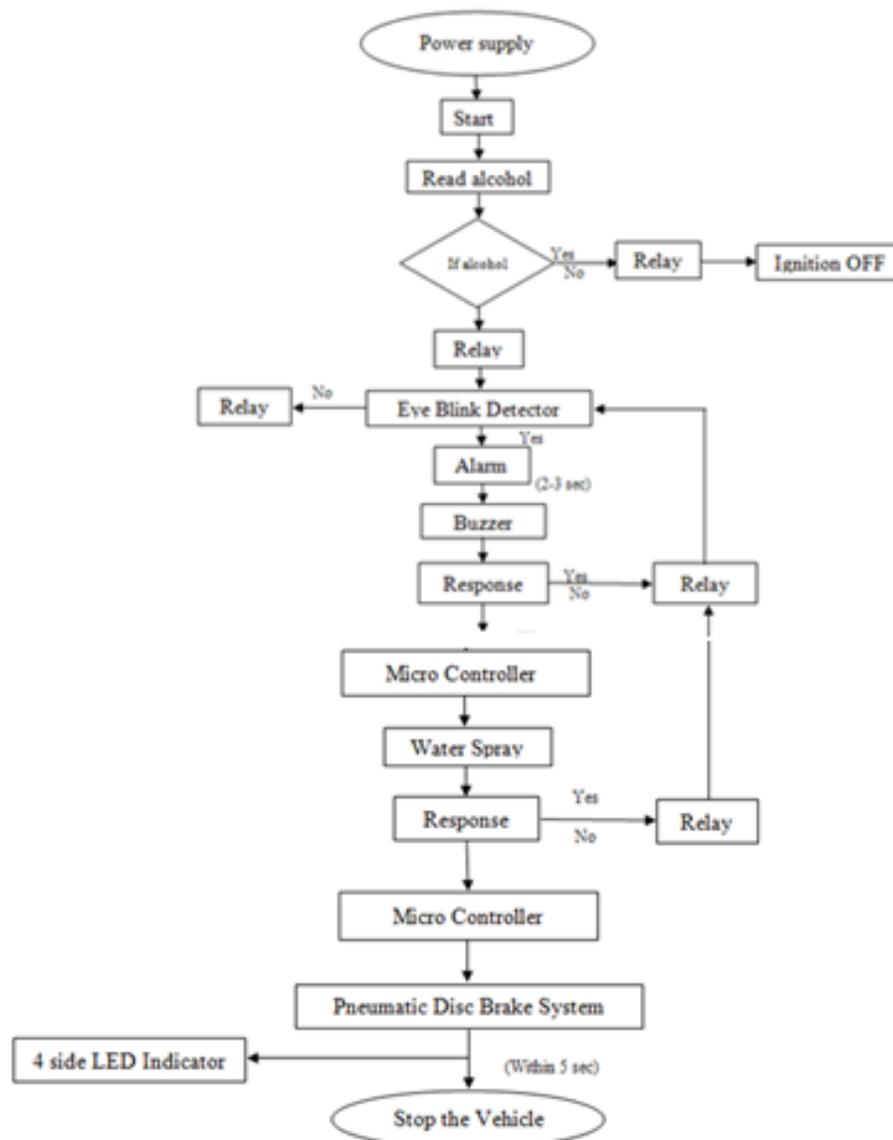


Figure.7. Scheme of the Proposed Algorithm

IV. EXPERIMENTAL RESULT

The fig1.8 shows the prototype of our project. It consists of pneumatic brake system and circuit board (Alcohol sensor, IR sensor, LCD and Microcontroller). EB – Eye Blink, AL – Alcohol, KY– Key, EN – Engine ON/OFF.



Figure.8.

The following are the experimental results observed while monitoring the states of the eyes that whether they are open or closed.



Figure.9. When eyes are open.

In fig1.9, the system has analyzed the state of the eyes as open, which means that the driver is awake.



Figure.10. When eyes are closed

In fig1.10, the system has analyzed the state of the eyes as closed, which means that the driver is drowsy. This will alert the driver with the help of a buzzer alarm.

V. APPLICATION

- ✓ Automobiles.
- ✓ Used in all vehicles like Car, Heavy Trucks, Long Driving Vehicle and also for night drives.
- ✓ This device provides a safety for Government Transport
- ✓ It is mainly useful for Tour and Travel Agency.

- ✓ It can also be used in schools, colleges, officers, and some public places taking attention of drunken person.

VI. FUTURE SCOPE

- ✓ Automated steering controlling system for vehicle will be used in future.
- ✓ An advanced technology of face detection image processing and scanning of license for start the vehicle will be used in future.

VII. CONCLUSION

Our Project is Automated Pneumatic Brake System while driver drowsiness and drunken drivers. Here Eye Blinking Sensor and Alcohol Detector are implemented successfully. Driver has accident prevention fatalities in now a days. Thus we can reduce the alcohol and drowsy accident in our environment. It has been made by automatic braking system in vehicle. By using Automated Pneumatic Brake System, brake can apply automatically to avoid collision. Also four side danger light indicator is used to alert the following driver about the vehicle condition. This system is more useful for the environment when compared with the other accident prevention system.

VIII. REFERENCE

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