# Development of an advanced automatic specialized vehicle using various sensors

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*Abstract-This paper describes a vehicle accident are recently increasing at a fast rate and diverse technology are being introduced to minimize vehicular accidents. This system provides a unique method to drunken and drowsy people. Accident prevention mainly used in alcohol sensor, IR sensor, Eye blink sensor, Obstacle sensor, Brake failure sensor, and Emergency Button embedded in the vehicle. Whenever the driver start the vehicle, the sensor senses the drowsiness is detected and the driver fails to the respond the warning signal from the buzzer and alcohol in this breathe and automatically sends the signal to buzzer, and vibration motor to LCD. In this system the outputs of the sensors are given to PIC microcontroller for comparison.*

**Keywords: Accident, Alcohol sensor, Eye blink sensor, IR sensor, Obstacle sensor, Brake failure sensor, Limit switch, Vibration motor, Voice board, Speaker, LCD.**

## INTRODUCTION

This project involves measure and controls the eye blink , alcohol , foot board , brake failure and  using various sensor. The IR transmitter is used to transmit the infrared rays in our eye. The IR receiver is used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. Alcohol detector detects the content of alcohol in the breath and thus it attempts to clamp down alcoholics. Obstacle full sized vehicles like buses confront with more moving persons around them comparing with small sized cars, they may need around view monitoring system instead single rear sensor to enlarge driver view angle. Despite low rate of obstacle sensor, they are unreliable because of possible  function and narrow detection range. IR sensor if anybody stands the foot board IR will be sense it. Hence this information to microcontroller comparison. The output analog convert to digital format. The PIC microcontroller controls the entire circuit. Driver circuit, vibration motor, bus motor and buzzer produces alarm.

## BASIC MODEL OF THE SYSTEM
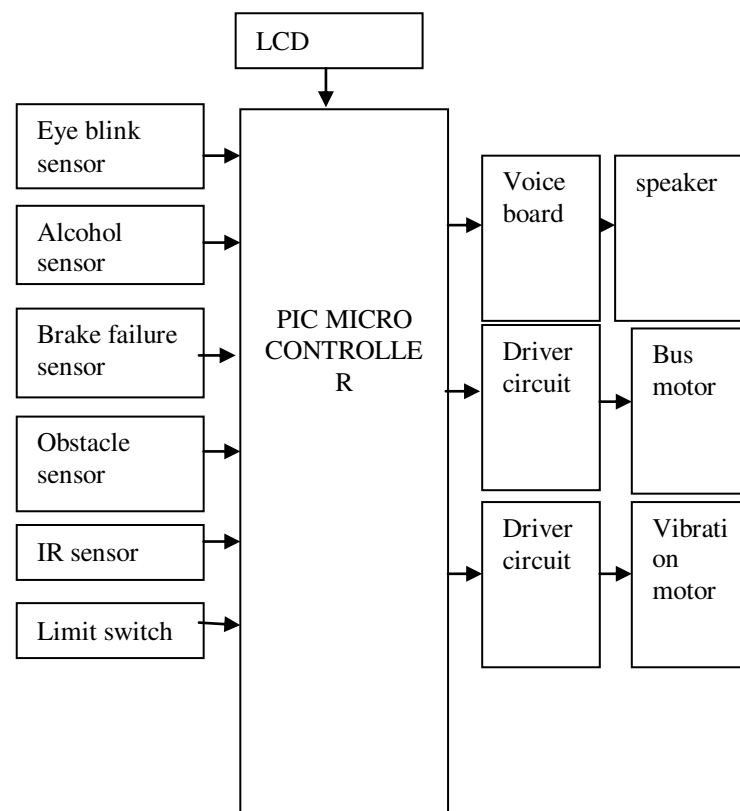
SCHEMATIC DIAGRAM





PIN DIAGRAM FOR PIC MICROCONTROLLER
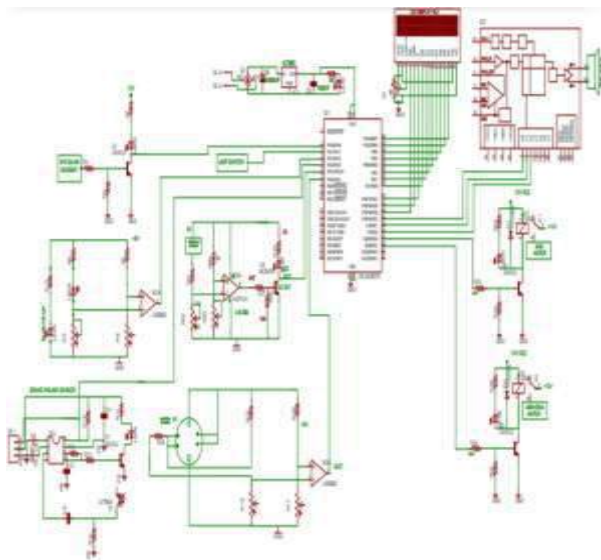
### A. MICROCONTROLLER

PIC microcontroller has three basic parts cpu, memory both ROM and RAM, digital input/output. Mostly used in microchip technology widely available Large user base, Extensive application notes, low cost, development to low cost.

The microcontroller is a special purpose device for example ,the microcontroller chip in calculator performs the function of calculator alone, unless its internal programming is changed. The basic microcontroller has 62% of its total instructions as multi byte instructions . Hence the program is more compact and runs faster to accomplish.

### A. EYE BLINKING SENSOR

This project involves controlling accident due to unconscious through Eye blink. Here one eye blink sensor is fixed in vehicle where if anybody loses conscious and indicate through alarm, GSM and LCD. This project involves measure and controls the eye blink using IR sensor. The IR transmitter is used to transmit. The infrared rays in our eye. The IR receiver used to receive the reflected infrared rays of eye. If the eye is closed means the output of IR receiver is high otherwise the IR receiver output is low. This to know the eye is closing or opening position. This output is given to logic circuit to indicate the alarm, lcd. This

circuit is mainly used to for counting application, intruder detector etc.

## MODULE OF EYE BLINK SENSOR

Figure 1- Lightweight, dark-pupil, eyetracking headgear

PC53XS scene camera

IR LED

Figure 5a – Closeup of the IRED, eye, and sc

## ALCOHOL SENSOR

The Alcohol detection system is designed to detect the presence of the amount of alcohol in the body. This system uses alcohol sensor detection of alcohol contents transfers the data to the controller. If the detected value higher than the threshold value. The ignition system down, thus prevention the drunk from driving. The MQ3 sensor converts analog signal into digital signal. This digital data is given to controller which compares the value with predefined threshold value. If the detected value is higher than the threshold value, a signal is sent to the alarm, inside the bus.

## MODULE FOR ALCOHOL SENSOR
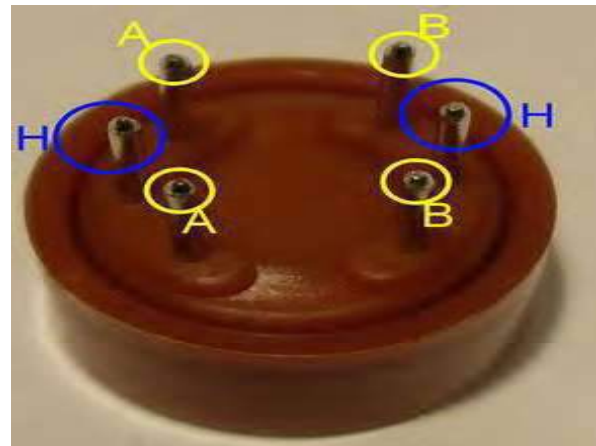
## IR SENSOR

The project involves the IR sensor at the foot board. If anybody stands on the foot board, IR will sense it. Hence, it sends the information to the PIC microcontroller. Also, we connected an alternator in the stop that connects the wheels. Thus shaft rotates when vehicle is moving. So, the alternator will also rotate and generates power than vehicle is moving. This information will also send to the microcontroller. So, by the analysis output from the above menlcorted sensors (at the foot board) and the alternator, microcontroller will come to a conclusion that whether the passenger is standing at the foot board when the bus is running or not. If microcontroller finds anybody standing at the footboard, the situation is informed through alarm. If the passenger still stands at the footboard ever after the information automatically, the bus will stop. [6] discussed about a system, GSM based AMR has low infrastructure cost and it reduces man power. The system is fully automatic, hence the probability of error is reduced. The data is highly secured and it not only solve the problem of traditional meter reading system but also provides additional features such as power disconnection, reconnection and the concept of power management.

MODULE FOR IR SENSOR

MODULE FOR OBSTACLE SENSOR



LIMIT SWITCH

BRAKE FAILURE SENSOR

Limit switch is used for the emergency purpose like critical attack, any health related emergency are to find your vehicle. Each vehicle has a unique emergency. Some can be operated only from a short distance, some work well from a long distance or some might get blocked by the obstacles.

In this project we are using control unit to check the Brake condition. Here we are sending the signal voltage through the Brake Wire from one end to other end. At the other end in the Wheel the signal conditioning unit checks that whether the signal voltage in the Brake wire is available or not. If the Brake Wire is in the good condition the signal and conditioning unit check that in coming small voltage signal. If any cut in the Brake wire there is no voltage signal in the braking end so signal and conditioning unit send the signal to control. Now the control unit activates the alarm through the driver circuit. The alarm gives the audible indication to the Rider

MODULE FOR LIMIT SWITCH

OBSTACLE SENSOR

The proposed system provides the driver with visual surround information around the vehicle without the blind spot of the image by converting top view of image obtained from the four sensors installed four sides of the vehicle.

## A. BUZZER

A buzzer or beeper is a signaling device, usually electronic, typically used in automobiles, household appliances such as a microwave oven, or game shows. It most commonly consists of a number of switches or sensors connected to a control unit that determines if and which button was pushed or a preset time has lapsed, and usually illuminates a light on the appropriate button or control panel, and sounds a warning in the form of a continuous or intermittent buzzing or beeping sound. Initially this device was based on an electromechanical system which was identical to an electric bell without the metal gong (which makes the ringing noise). Often these units were anchored to a wall or ceiling and used the ceiling or wall as a sounding board. Another implementation with some AC-connected devices was to implement a circuit to make the AC current into a noise loud enough to drive a loudspeaker and hook this circuit up to a cheap8-ohm speaker. Nowadays, it is more popular to use a ceramic- based piezoelectric sounder like a Sonalert which makes a high-pitched tone. Usually these were hooked up to

"driver" circuits which varied the pitch of the sound or pulsed the sound .The circuit is designed to control the buzzer. The buzzer ON and OFF is controlled by the pair of switching transistors (BC 547). The buzzer is connected in the Q2 transistor collector terminal. When high pulse signal is given to base of the Q1 transistors, the transistor is conducting and close the collector and emitter terminal so zero signals is given to base of the Q2 transistor. Hence Q2 transistor and buzzer is turned OFF state. When low pulse is given to base of transistor Q1 transistor, the transistor is turned OFF. Now 12v is given to base of Q2 transistor so the transistor is conducting and buzzer is energized and produces the sound signal.

LCD:

Liquid crystal display have materials which combine the properties of both liquids and crystals. Rather than having a melting point, they have a temperature range within which the molecules are almost as mobile as they would be in a liquid, but are grouped together in an ordered form similar to a crystal. An LCD consists of two glass panels, with the liquid crystal material sandwiched in between them. The inner surface of the glass plates are coated with transparent electrodes which define the character, symbol or patterns to be displayed. Polymeric layers are present in between the electrodes and the liquid crystal, which makes the liquid crystal molecules to maintain a defined orientation angle.

EXISTING METHOD:

Vehicle safety addresses the safety of all road users and currently comprises measures to help avoid a crash (crash avoidance) or reduce injury in the event of a crash (crash protection)Substantial and evidence-based improvements have been made in the last 15 years and research has identified large scope for enhancing vehicle safety further.

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PROPOSED SYSTEM:

The People standing at the footboard of the bus, when the bus is moving, whether the driver is sleeping, while driving the bus, To check for the overload condition, To get help from others in case of emergency condition

III.    APPLICATIONS

This device provides much advanced facilities in now a days life as it can be easily implemented in vehicles. This device provides safety for government transports. It is useful for tour & travel agency. It can also be used in schools, colleges, offices and some public places taking attention of drunken persons. Military application where high intensity monitoring of soldier is needed.

V.FUTURESCOPE

If drivers are not quite sober, the car locks up the ignition system thereby preventing the driver from getting on the road. Instead of alarm we can use Automatic Braking which will slow down or stop the vehicle. By using wireless technology ,if the driver is drunken it will send signals to vehicles nearby about this so others driver become alert.

CONCLUSION

Our project Development of an advanced automatic specialized vehicle using various sensors was implemented successfully. This device provides much advanced facilities in now a days life as it can be easily implemented in vehicles. Thus we can reduce alcohol and drowsy related road accidents and hence these kinds of detectors have a great relevance. It can also be used in schools, colleges, offices and some public places such as hospitals, libraries etc. Through this project we present hardware programming of microcontroller to facilitate as alcohol sensor, eye blinking sensor, brake failure sensor, obstacle sensor, IR sensor, limit switch.

VII.REFRENCES

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