

Eog Less Automatic Accident Prevention Using Arduino

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Abstract: — Now-a-days, accidents due to drowsiness condition are one of the major problems on highway. These types of accidents occurred due to drowsy and driver cannot able to control the vehicle, when he/she wakes. Accidents due to drowsy is prevented and controlled when the vehicle is out of control. Also the drunken drive also prevented with the help of alcohol detector in the vehicle. Here we are using accelerometer sensor for recognizing the driver is in the drowsiness condition. The drowsiness is identified by the accelerometer sensor by measuring the angle of tilt of the driver's head. The accelerometer sensor is worn by the driver by means of the spectacles frames or cap. The alcohol consumption is also verified during the starting process of 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. If the driver is in drowsiness condition then the system will give alarm signal and the speed of the vehicle is reduced. The ultrasonic sensor will sense the obstacle to avoid collision with that and vehicle will be parked with indications. Also the message is displayed on LCD display in the vehicle to aware the passengers that the driver is drowsy through GSM.

Keywords: - accelerometer sensor, arduino, automatic vehicle movement control, Driver drowsiness detection, ultrasonic sensor.

I. INTRODUCTION

The slogan for defensive driving is "Driving to save lives, time and money in spite of the conditions around you and the actions of others". Accidents are increasing at large pace and various technologies are being introduced to reduce the accidents. There are various reasons to occur accidents such as drivers' drowsiness, drunk driving, texting, high speed. It was demonstrated that the 20% of accidents are occurred due to drivers' drowsiness. In market to prevent the accident there are EOG (Electrooculography) based systems are available which are very much expensive due to EOG sensor. This is main disadvantage of EOG sensor. This system uses accelerometer which gives the solution over the disadvantages of EOG sensor. Here we are detecting the driver's drowsiness condition by head movement detection using accelerometer sensor which measures the three axes.

II.BLOCK DIAGRAM:-

The block diagram shows that the basic process of the Automatic accident prevention using arduino. The head movement of driver is detected by accelerometer. The output of the accelerometer is given to the arduino. Arduino generates control signal which is given to the different applications such as motor driver circuit, GSM module, alarm, sprinkler. Here we are using GSM 500 module to send the signal to control panel. So that they can get action to prevent the accident. Water sprinkler is used to wake up

III.MOVEMENT DETECTION

The accelerometer is used for head movement detection. The MPU6050/GY521 is a three axis gyroscopic accelerometer which measures the axis detection. An accelerometer is an electromechanical device used to measure acceleration forces. Such forces may be static, like the continuous force of gravity or, as is the case with many mobile devices, dynamic to sense movement or vibrations. Acceleration is the measurement of the change in velocity, or speed divided by time. Accelerometers in mobile phones are used to detect the orientation of the person.

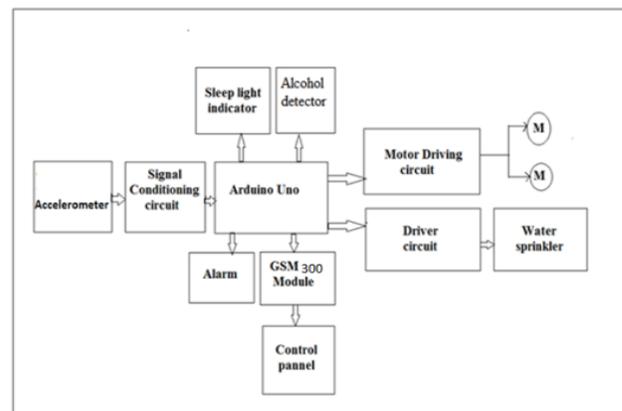


Fig. :- Block Diagram

driver. The motor driver circuit is used to minimize the speed of vehicle. The alarm circuit is provided to alert the driver and passengers about the drowsy condition of driver. Why to use accelerometer instead of EOG?

1. Accelerometer is very much cost effective as compared to EOG, because the cost of EOG is in the range of Rs.22000-27000 where as the cost of accelerometer is in the range of Rs. 400-500.

2. If driver has spectacles then the sensitivity of the EOG is reduces.

3. If driver does not going to use the accelerometer then system will give the warning that the 'accelerometer is not connected', but such facility is not possible is in the case of EOG.

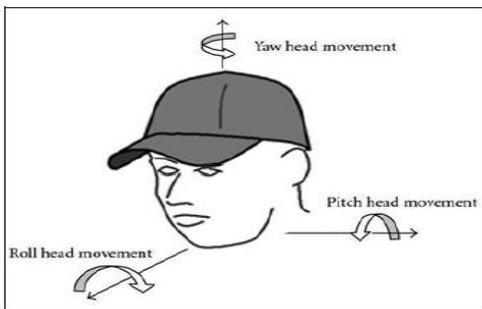


Fig:-Three possible head tilt movement.

IV. ARDUINO

Arduino uno is a microcontroller board based on the ATmega328. It has 14 digital input/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, 16 MHz ceramic resonator, a USB connection, a power jack and a reset button. Arduino's processor basically uses the Harvard architecture.

V. ULTRASONIC SENSOR

Ultrasonic sensor have an acoustic transducer which is vibrating at ultrasonic frequencies. The pulses are emitted in a cone-shaped beam and aimed at a target object. The device measures the time delay between each emitted and echo pulse to accurately determine the sensor-to-target distance. It produces 40KHz sound to detect the distance. The output of Ultrasonic Sensor is given to the ADC of Arduino. The ultrasonic sensor is used to measure the distance between vehicle and any obstacles. So that we can prevent the accident. When driver is in drowsy condition the speed of vehicle is automatically reduced. the ultrasonic

sensor can sense if any obstacles are very close to the vehicle and alerts the driver so he/she can take action to change the direction of his/her vehicle.

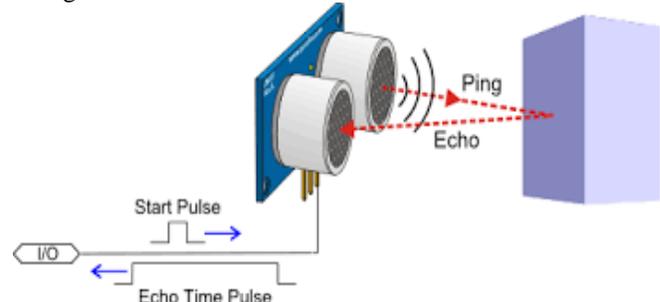


Fig:-Ultrasonic sensor

VI. ALCOHOL SENSOR

We have used MQ-2 as a alcohol sensor. The MQ2 has an electrochemical sensor, which changes its resistance for different concentrations of varied gasses. When one of the gaseous elements like H₂, LPG, alcohol, smoke, CH₄, CO etc. comes in contact with the sensor after heating, the sensor's resistance change. The change in the resistance changes the voltage across the sensor, and this voltage can be read by a microcontroller.

VII. CONCLUSION

When driver is in sleepy mode he is not able to control his vehicle and by the time he gets realize it there is an accident. On the highways the speed of vehicles is very high, so that handling is very difficult. In this project we have generated a model which can prevent such accidents. This project involves the measure and control of head movement using accelerometer sensor. Also we have detected the alcohol consumption and distance between the vehicle and obstacle to prevent the accident. The status of driver is informed to the control panel that the driver is in drowsy condition through GSM module. This system is EOG less system.

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