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Automatic Alcohol Detection System Using Microcontroller

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ABSTRACT

The purpose of this project is to detect whether a person is in the state of driving a vehicle and develop vehicle accident prevention to reduce accident under the influence of alcohol or due to drowsiness. This project is developed by interfacing the alcohol sensor and eye blink sensors with the microcontroller AT8C952. Further a Gsm is used for alerting the driver's relative or the traffic controller police that the person is in drunken state. The alcohol sensor used in this project is MQ-3 which is used to detect the alcohol content in human breath. A motor is used as a prototype to act like a vehicle's engine. The ignition system will operate based on the level of blood alcohol content (BAC) from human breaths detected by alcohol sensor.The main purpose behind this project is "Drunk driving detection". Now a days, many accidents are happening because of the alcohol consumption of the driver. Thus Drunken driving is a major reason of accidents in almost all countries all over the world.This project should be installed inside the vehicle.

Keywords: AT89C51, MQ3, eye blink sensor, GSM

I. INTRODUCTION

This paper presents the progress in using a alcohol Detector, a device that senses a change in the alcoholic gas content of the surrounding air. The sensor will then analyze the amount of alcoholic vapors and offer the user some indication of the amount of alcohol present with the help of the lcd and the buzzer. This device is more commonly referred to as a breath analyzer; as it analyzes the alcohol content from a person's breath.The microcontroller is interfaced with a MQ-3 alcohol sensor, which serves as the analog input signal to the microcontroller. There is a LCD attached to six output pins that will function as a display. Depending on the amount of alcohol present, the MQ-3 sensor will analyze its contents and consequently the sensor output voltage will increase. If output voltage increases enough, input pins on the microcontroller will change from active low state to active high state. According to the output of the microcontroller the motor will be driven with the help of L293D as driver IC.The eyeblink sensors which consist of 2 important parts :- IR Transmitter and IR Receiver.The IR Transmitter is used to transmit the infrared rays to the eyes whereas the latter is used to reflect the the infrared from the eyes.If the eyes are closed it means that output of ir receiver is high, otherwise low. The eyeblink sensors are mounted on a google which the driver will wear.

II. EXPERIMENTAL SECTION

The construction of this system consists of two parts which is hardware development and software development. Hardware development involves the designing of the circuit of the project and printed circuit board (PCB) works. While the software developments are focused on simulating the circuit before test to the real component and also designing coding to be embedded in the hardware.

Hardware Development:

Microcontroller AT89C51 :

Features:

- ✓ Compatible with MCS-51™ Products
- ✓ 4K Bytes of In-System Reprogrammable Flash Memory
- ✓ Endurance: 1,000 Write/Erase Cycles
- ✓ Fully Static Operation:0Hz to 24 MHz
- ✓ Three-level Program Memory Lock
- ✓ 128 x 8-bit Internal RAM
- ✓ 32 Programmable I/O Lines
- ✓ Two 16-bit Timer/Counters
- ✓ Six Interrupt Sources
- ✓ Programmable Serial Channel
- ✓ Low-power Idle and Power-down Modes.

MQ -3 Sensor:

Sensitive material of MQ-3 sensor is SnO2, which with lower conductivity in clean air.

Character configuration:

- Good sensitivity
- Long life and low cost
- Simple drive circuit and low power consumption

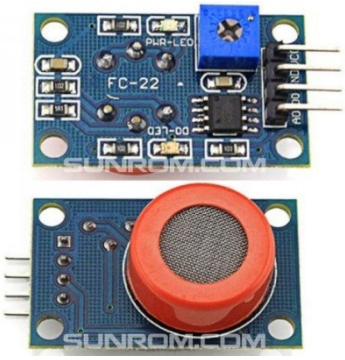


Figure 1

Buzzer:

Features:

• The PS series are high-performance buzzers that employ Uni-morph piezoelectric elements and are designed for easy incorporation into various circuits.

• They feature extremely low power consumption.

Eyeblink Sensors:

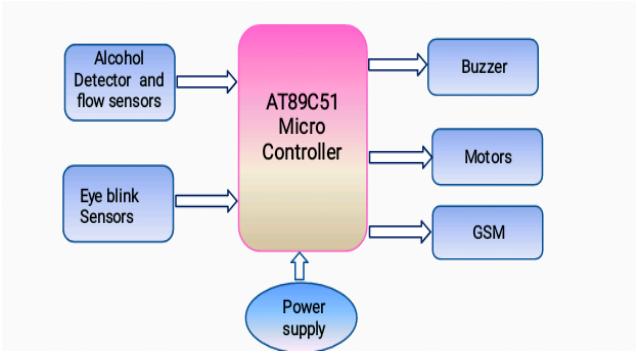
Features:

- The IR Transmitter is used to transmit the infrared rays to the eyes and IR receiver is used to reflect the the infrared from the eyes.
- If the eyes are closed it means that output of ir receiver is high, otherwise low.
- The eyeblink sensors are mounted on a goggle which the driver will wear.

GSM:

It is technique operates over a SIM(subscriber identification module). In GSM techniques separate frequency slots are available for each SIM. The spacing between two band of frequencies channel is 666KHz. All over mobile phone system operate over frequency spectrum.

III. BLOCK DIAGRAM OF THE SYSTEM



IV. RESULTS AND DISCUSSION

Detection of Alcohol and Prevention of Accident:

At first, the value of BAC is set in the microcontroller. Lcd, Eyeblink Sensors, Buzzer,MQ-3 Sensors, Motor, Gsm, Capacitors, Resistors are all connected together. The alcohol sensor senses the alcohol level in the air. When the sensed level goes beyond threshold limit the control will not be sent to the motor and the car will not start. The sensed level depends upon the sensitivity of the alcohol sensor. It senses the alcohol level in the human breath. This value is then sent to the ADC. This ADC is used to convert the analog values to the digital values and those digital values are

in turn sent to the microcontroller. The least alcohol level is initially set in the calibration and the digital value from the ADC is compared with the value that is present. The alcohol sensor takes atleast five to ten seconds to sense the value. If the sensed value is less than or equal to the value set the control will be sent to the motor and the car will be started. If the sensed value is greater than the set value then the car will not start. LCD is also connected to the microcontroller which shows all the sensed values. The buzzer is also connected which is used to indicate when the value goes beyond the set value. Also if driver is drowsy or feeling sleepy then the eyeblink sensors will sense it and this will be indicated with the help of the buzzer and motor gradually stops. After this the Gsm system works and drops a message to the nearest traffic controller police or office that the vehicle at the particular address has a drunken driver and immediate action should be taken.

V. CONCLUSION

In this study, we have empirically demonstrated that Starting with a requirement to develop a non invasive technology that will quickly and accurately measure a driver's BAC, and the eyeblink sensors is used to detect whether the driver is sleepy. The project team has established a Program Plan, developed Performance Specifications, solicited industry interest, and begun the process of identifying technological approaches that show promise. The adoption of non-regulatory, voluntary approaches to the implementation of advanced vehicle technology makes it critical that policy and public acceptance issues be addressed concurrent with the technology development. This is particularly important when it comes to the widespread implementation of technologies to prevent alcohol-impaired drivers from getting behind the wheel. The majority of the driving public in the United States either does not drink, or does not drink and drive. It is therefore necessary that advanced technologies to assess BACs must be seamless with the operation of the vehicle and not impede the sober driver. The general public fully understands the dangers of drinking and driving. In a survey on drinking and driving attitudes and behavior (NHTSA, 2003), ninety-seven percent of respondents indicated that drinking and driving is a threat to their personal safety. With the growing public perception that vehicle safety is an important factor in the vehicle purchase decision, advances in safety technology are gaining public acceptance more readily than in the past. Communicating with the public regarding the DADSS program, the potential technologies that are being developed, and the way in which these might be implemented will be an important component of this effort.

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