



DRIVER DROWSINESS DETECTION AND ALERTING SYSTEM

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ABSTRACT

This project is about making cars more intelligent and interactive which may notify or resist user under unacceptable conditions, they may provide critical information of real time situations to rescue or police or owner himself. Driver fatigue resulting from sleep deprivation or sleep disorders is an important factor in the increasing number of accidents on today's roads. In this project, we describe a real-time 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.

In this project, we propose a driver drowsiness detection system in which sensor like eye blink sensor are used for detecting drowsiness of driver. If the driver is found to have sleep, buzzer will start buzzing and then turns the vehicle ignition off.

INTRODUCTION

Automotive population is increasing exponentially in the country. The biggest problem regarding the increased traffic is the raise in number of road accidents. Road accidents are undoubtedly a global menace in our country. The global status report on road safety published by the World Health Organization (WHO) identified the major causes of road accidents are due to driver errors and carelessness. Driver sleepiness, alcoholism and carelessness are the key players in accident scenario. The fatalities and associated expenses as a result of road

accidents are very serious problems. Driver fatigue is a significant factor in an ample of vehicle accidents. Therefore, a technology to prevent and detect driver drowsiness is a major challenge in the field of accident-avoidance systems. Since the drowsiness presents a hazard on the road, therefore counteractive methods need to be developed to deal with its effects. The focus is on designing a system that will accurately monitor the duration of open or closed state of the driver's eyes in real-time. By monitoring the eyes, the driver can be alerted well in advance to avoid accidents



and this is possible if longer eye blinks are detected. The analysis of face images is a research area with following features and applications as virtual tools face recognition, and human identification security systems but this project focuses on IR transmittance and reception by eye blink sensor and the system is designed to determine whether the eyes of the driver are opened or closed due to fatigue followed by accident detection.

AT89C52 MICROCONTROLLER

Microcontroller is a general-purpose device, which integrates a number of the components of a microprocessor system on to single chip. It has inbuilt CPU, memory and peripherals to make it as a mini computer. A microcontroller combines on to the same microchip they are CPU core, Memory (both ROM and RAM), Some parallel digital I/o. Microcontrollers are small in size, inexpensive, consumes less power.

Micro controller is a standalone unit, which can perform functions on its own without any requirement for additional hardware like I/O ports and external memory. The heart of the microcontroller is the CPU core. In the past, this has traditionally been based on an 8-bit

microprocessor unit. For example, Motorola uses a basic 6800 microprocessor core in their 6805/6808 microcontroller devices.

The AT89C51 is a low-power, high-performance CMOS 8-bit microcomputer with 4K bytes of Flash Programmable and Erasable Read Only Memory (PEROM). The device is manufactured using Atmel is high density non-volatile memory technology and is compatible with the industry standard MCS-51™ instruction set and pinout.

The on-chip Flash allows the program memory to be reprogrammed in-system or by a conventional non-volatile memory programmer. By combining a versatile 8-bit CPU with Flash on a monolithic chip, the Atmel 89C52 is a powerful microcomputer which provides a highly flexible and cost-effective solution to many embedded control applications.

The stack refers to an area of internal RAM that is used in conjunction with certain opcodes to store and retrieve data quickly. The 8-bit Stack Pointer (SP) register is used by the 8051 to hold an internal RAM address that is called the top of the stack. The address held in the SP register is the



location in internal RAM where the last byte of data was stored by a stack operation.

When data is to be placed on the stack, the SP increments before storing data on the stack so that the stack grows up as data is stored. As data is retrieved from the stack, the byte is read from the stack, and then the SP decrements to point to the next available byte of stored data.

Operation of the stack and the SP is shown above. The SP is set to 07h when the 8051 is reset and can be changed to any internal RAM address by the programmer, I.e., default address location of stack pointer is 07h. Using a data move command, we can change the stack pointer address.

HARDWARE COMPONENTS

Transformer is a static device used to convert the voltage from one level to another level without change its frequency.

There are two types of transformers

1. Step-up transformer
2. Step-down transformer

Step-up transformer converts low voltage level into high voltage level without change its frequency.

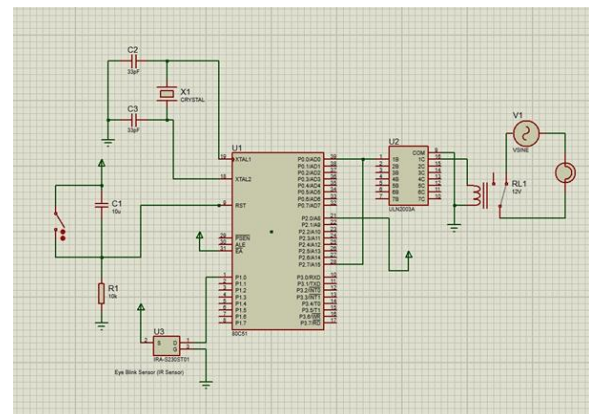
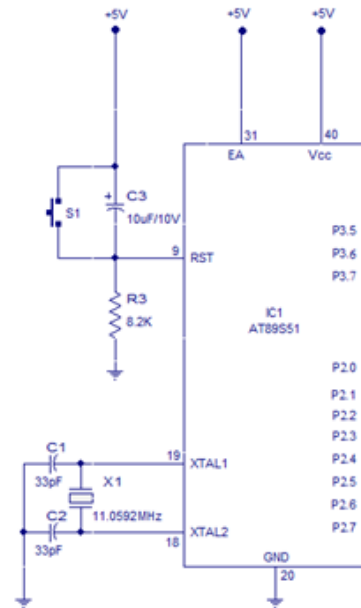
Step-down transformer converts high voltage level into low voltage level without change its frequency.

Voltage sources in a circuit may have fluctuations resulting in not providing fixed voltage outputs. The internal current-limiting and thermal-shutdown features of these regulators essentially make them immune to overload. A voltage regulator IC maintains the output voltage at a constant value. 7805 IC, a member of 78xx series of fixed linear voltage regulators used to maintain such fluctuations, is a popular voltage regulator integrated circuit (IC). The XX in 78XX indicates the output voltage it provides. 7805 IC provides +5 volts regulated power supply with provisions to add a heat sink.

Relays are switching that open and close circuits electromechanically or electronically. Relays control one electrical circuit by opening and closing contacts in another circuit. As relay diagrams show, when a relay contact is normally open (NO), there is an open contact when the relay is not energized. When a relay contact is Normally Closed (NC), there is a closed contact when the relay is not energized. In either case, applying electrical current to the contacts will change their state. In our project we are using relay and relay drive on a single chip.

DESIGN IMPLEMENTATION

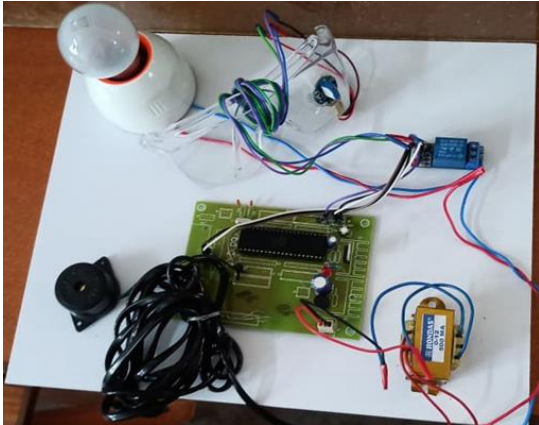
The power supply that comes to our house is generally 230v AC, but our requirement of operation of our circuit is 5v, so by using transformer we convert 230v AC to 12v AC, and after converting to 12v the output of the transformer (12v AC) is given to the onboard bridge rectifier. The bridge rectifier is used to convert AC input to the DC output here we are converting 12v AC to 12v DC, But the microcontroller operates at 5v DC so by using the voltage regulator we are converting 12v DC to the 5v AC. Thus, power supply is given to the circuit. The 8051 microcontroller which is the main part of the project is soldered on PCB board and then the eye blink sensor is connected to port P1.0 of the microcontroller. Buzzer is connected to port P2.0 of the microcontroller and the ignition unit is connected to P2.1 of the microcontroller. The Crystal and reset interfacing to 8051 microcontroller takes place as shown in



RESULTS

The practical implementation of project where eye blink sensor is connected to P 1.0 of microcontroller , Buzzer is connected to P2.0 of Micro controller , and P2.1 is connected to the ignition unit. The eye blink sensor is connected to microcontroller of port P1.0 and then from the micro controller

of port P2.0 buzzer is connected and microcontroller of port P2.1 is connected to ignition unit with the help of relay.



CONCLUSION

- The ultimate goal of the system is to check the drowsiness condition of the driver. Based on the eye movements of the driver, the drowsiness is detected
- According to eye blink, the alarm will be generated to alert the driver and to reduce the speed of the vehicle along with the indication of parking light. By doing this, many accidents will be reduced and provides safety to the driver and vehicle.
- The drowsiness detection system is capable of detecting drowsiness in quickly.
- The system which can differentiate normal eye blink and drowsiness can prevent the driver from entering the state of sleepiness while driving.

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IJARST

International Journal For Advanced Research In Science & Technology

A peer reviewed international journal

ISSN: 2457-0362

www.ijarst.in

Pure and Applied Mathematics Special Issue
2250 Science Trends and Technology
(IJCST) – Volume 3 Issue 4, Jul - Aug 2015