

DASHBOARD MONITORING AND DROWSY DRIVER DETECTION DEVICE AND DRIVER ALERTING SYSTEM

C.NAZEEMA, S.MOHAN DAS

M.Tech Student, Associate Professor

DEPT OF ECE

SVR Engineering College, Nandyal

ABSTRACT: The project aims at designing a system which monitors the Drowsy Driver Detection Device And Driver Alerting System and send the details through Wi-Fi module to the user android phone. The ARDUINO is a low cost, credit-card sized computer that can be used in electronics projects. It is a capable little device that enables people of all ages to explore computing, and to learn how to program in languages like C. It's capable of doing everything you'd expect a desktop computer to do, from browsing the internet and playing high-definition video, to making spreadsheets, word-processing, and playing games.

The device which is able to perform the task is a ARDUINO processor. There are different sensors such as Temperature, eye blink, fire, alcohol sensors. Temperature sensor measures temperature of a person. Eye blink sensor sense when driver gone to sleep. Fire sensor for when fire occurs fire sensor will detect. Alcohol sense when the person is alcohol saved. When the one of the sensor detect motor will get off and through GSM we get the indication. All the seAll these parameters values are fed to the Arduino processor. All the parameter values are sent to the user mobile phone through message and also constantly displayed on the LCD. Then we will get the Buzzer indication also.

I. INTRODUCTION:

The frequency of traffic collisions in India is the highest in the world. A National Crime Records Bureau (NCRB) report revealed that every year, more than 135,000 traffic collisions related deaths occur in India. The extent of Accidents in Tamil Nadu records the highest road accidents for a decade and its capital Chennai has more accidents than any other city in India. Traffic collision related deaths increased from 13 per hour in 2008 to 14 per hour in 2009.

Driver drowsiness detection is a car safety technology which helps prevent accidents caused by the driver getting drowsy. Various studies have suggested that around 20% of all road accidents are fatigue-related, up to 50% on certain roads .Some of the current systems learn driver patterns and can detect when a driver is becoming drowsy .The development of technologies for detecting or preventing drowsiness at the wheel is a major challenge in the field of accident avoidance systems. Because of the hazard that drowsiness presents on the road, methods need to be developed for counteracting its affects [4]. The aim of this project is to develop a prototype drowsiness detection system. The focus will be placed on designing a system that will accurately monitor the eye blink rate, heart-beat respiration rate and temperature of the driver .In this project we use sensors to measure all these factors. The values measured will be sent to the microcontroller where the measured values will be compared with the reference values. If the values measured do not match with the reference values then the microcontroller will send a warning signal in the LCD display thereby preventing accidents.

II. LITERATURE REVIEW:

To analyze driver's drowsiness several systems have been built. They require simplifying the problem to work under special conditions for example D.Taneral presents automatic drowsy driver monitoring and accident prevention system that is based on monitoring the changes in the eye blink duration

Driver Fatigue is among the most common reason for fatal road accidents around the world. This shows that in the transportation industry especially, where a driver of a heavy vehicle is often exposed to hours of monotonous driving which causes fatigue without frequent rest period. Due to the frequent occurrence of driver fatigue this has become an area

of great socio economic concern. Detecting driver's drowsiness has been a research topic for many years, with many approaches being studied thus so far. The work presented in [4] takes advantage of some mouth geometrical features to detect yawning. The work in [5] proposes the detection of the face region using the difference image between two images. Driver's yawn is then detected based on the distance between the midpoint of nostrils and the chin. [6] Uses Gravity-center template to detect the face. It then uses grey projection and Gabor wavelets to detect the mouth corners. Finally LDA is applied to classify feature vectors to detect yawning. [7] It presents a system where the face is located through Viola-Jones face detection method in a video frame. Then, a mouth window is extracted from the face region, in which lips are searched through spatial fuzzy c means (s-FCM) clustering. In [8] there is an advantage of two cameras: a low resolution camera for the face and a high resolution one for the mouth. It then uses haar-like features to detect driver's mouth and yawning is detected by the ratio of mouth height and width. In [9] a method is adopted for yawning detection based on the changes in mouth geometric features. The work in [10] driver's drowsiness is determined using vehicle based measures, behavioral measures and psychological measures which makes this a hybrid drowsiness detection system. [11] Shows detection of drowsiness based on head movement and geometrical features of mouth is proposed. Experiment was conducted on sample size of 50 video clips and observed that head movement contributes about 8% and yawning contributes about 49%

III. DESIGN OF HARDWARE

Arduino Uno

The most common version of Arduino is the Arduino Uno. This board is what most people are talking about when they refer to an Arduino. The Uno is one of the more popular boards in the Arduino family and a great choice for beginners. There are different revisions of Arduino Uno, below detail is the most recent revision (Rev3 or R3).

The 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, a 16 MHz ceramic resonator, a USB

connection, a power jack, an ICSP header, and a reset button. It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with an AC-to-DC adapter or battery to get started.

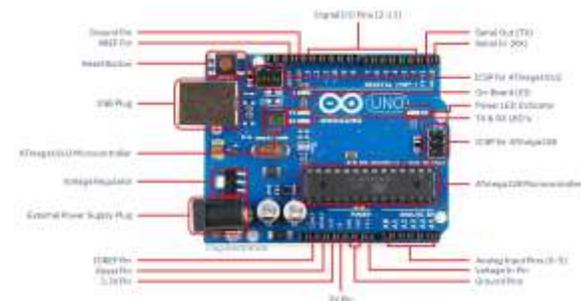


fig 1 ArduinoUno R3 Board

. POWER SUPPLY:

The power supplies are designed to convert high voltage AC mains electricity to a suitable low voltage supply for electronic circuits and other devices. A power supply can be broken down into a series of blocks, each of which performs a particular function. A d.c power supply which maintains the output voltage constant irrespective of a.c mains fluctuations or load variations is known as "Regulated D.C Power Supply".

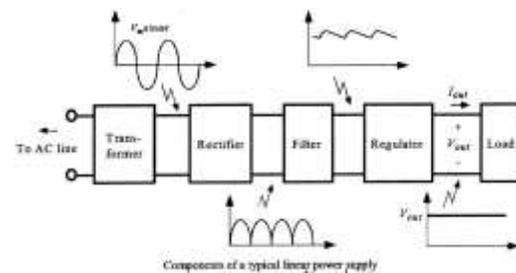


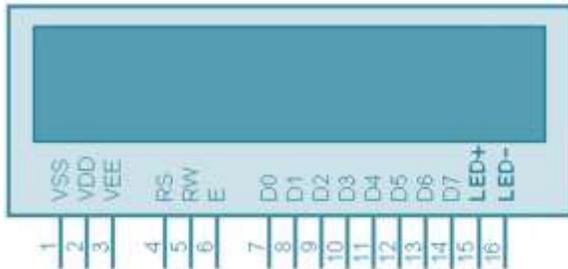
Fig:2 Block Diagram of Power Supply

LCD DISPLAY

Liquid Crystal Display also called as LCD is very helpful in providing user interface as well as for debugging purpose. The most commonly used Character based LCDs are based on Hitachi's HD44780 controller or other which are compatible with HD44580. The most commonly used LCDs found in the market today are 1 Line, 2 Line or 4 Line LCDs which have only 1 controller and support at most of 80 characters, whereas LCDs supporting

more than 80 characters make use of 2 HD44780 controllers.

Pin Description



SWITCH

A push-button (also spelled pushbutton) or simply button is a simple switch mechanism for controlling some aspect of a machine or a process. Buttons are typically made out of hard material, usually plastic or metal. The surface is usually flat or shaped to accommodate the human finger or hand, so as to be easily depressed or pushed. Buttons are most often biased switches, although many un-biased buttons (due to their physical nature) still require a spring to return to their un-pushed state. Terms for the "pushing" of a button include pressing, depressing, mashing, hitting, and punching.

The "push-button" has been utilized in calculators, push-button telephones, kitchen appliances, and various other mechanical and electronic devices, home and commercial. In industrial and commercial applications, push buttons can be connected together by a mechanical linkage so that the act of pushing one button causes the other button to be released. In this way, a stop button can "force" a start button to be released. This method of linkage is used in simple manual operations in which the machine or process has no electrical circuits for control.

Red pushbuttons can also have large heads (called mushroom heads) for easy operation and to facilitate the stopping of a machine. These pushbuttons are called emergency stop buttons and for increased safety are mandated by the electrical code in many jurisdictions. This large mushroom shape can also be found in buttons for use with

operators who need to wear gloves for their work and could not actuate a regular flush-mounted push button.



Fig: 3.Switch

Ultrasonic sensor:

The sensor is primarily intended to be used in security systems for detection of moving objects, but can be effectively involved in intelligent children's toys, automatic door opening devices, and sports training and contact-less-speed measurement equipment.

Introduction

Modern security systems utilize various types of sensors to detect unauthorized object access attempts. The sensor collection includes infrared, microwave and ultrasound devices, which are intended to detect moving objects. Each type of sensor is characterized by its own advantages and drawbacks. Microwave sensors are effective in large apartments because microwaves pass through dielectric materials. But these sensors consist of expensive super-high frequency components and their radiation is unhealthy for living organisms.

Infrared sensors are characterized by high sensitivity, low cost and are widely used. But, these sensors can generate false alarm signals if heating systems are active or temperature change speed exceeds some threshold level. Moreover, infrared sensors appreciably lose sensitivity if small insects penetrate the sensor lens. Ultrasound motion detection sensors are characterized by small power consumption, suitable cost and high sensitivity. That it why this kind of sensor is commonly used in home, office and car security systems. Existing ultrasound sensors

consist of multiple passive and active components and are relatively complicated for production and testing. Sensors often times require a laborious tuning process.

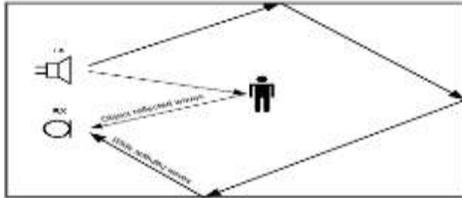


Figure : Basic Sensor Operation Principle

The ultrasound transmitter **TX** is emitting ultrasound waves into sensor ambient space continuously. These waves are reflecting from various objects and are reaching ultrasound receiver **RX**. There is a constant interference figure if no moving objects are in the placement.

IR BASED EYE BLINK SENSOR

Description:

The Objective of this project is to develop a system to keep the vehicle secure and protect it by the occupation of the intruders.

Scope:

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

Function:

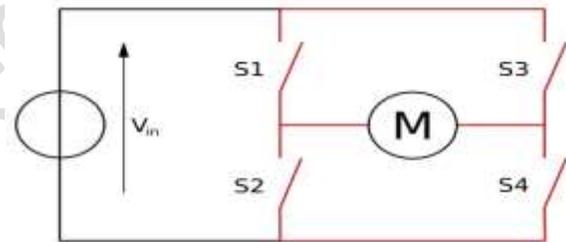
This Eye Blink sensor is IR based , . The Variation Across the eye will vary as per eye blink . If the eye is closed means the output is high otherwise output is low. This to know the eye is closing or opening position. This output is give to logic circuit to indicate the alarm. This can be used for project involves controlling accident due to unconscious through Eye blink.

THEORY OF DC MOTOR

The speed of a DC motor is directly proportional to the supply voltage, so if we reduce the supply voltage from 12 Volts to 6 Volts, the motor will run at half the speed. How can this be achieved when the battery is fixed at 12 Volts? The speed controller works by varying the average voltage sent to the motor. It could do this by simply adjusting the voltage sent to the motor, but this is quite inefficient to do. A better way is to switch the motor's supply on and off very quickly. If the switching is fast enough, the motor doesn't notice it, it only notices the average effect.

When you watch a film in the cinema, or the television, what you are actually seeing is a series of fixed pictures, which change rapidly enough that your eyes just see the average effect - movement. Your brain fills in the gaps to give an average effect.

H-BRIDGE:



An H-bridge is an electronic circuit which enables DC electric motors to be run forwards or backwards. These circuits are often used in robotics. H-bridges are available as integrated circuits, or can be built from discrete components.

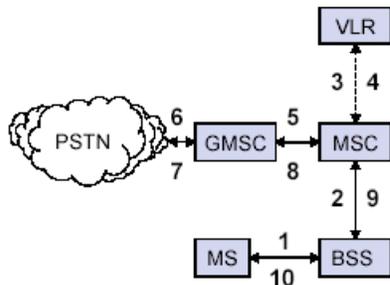
GSM



Call Routing

- Call Originating from MS
- Call termination to MS

Outgoing Call



TEMPERATURE SENSOR (LM35):

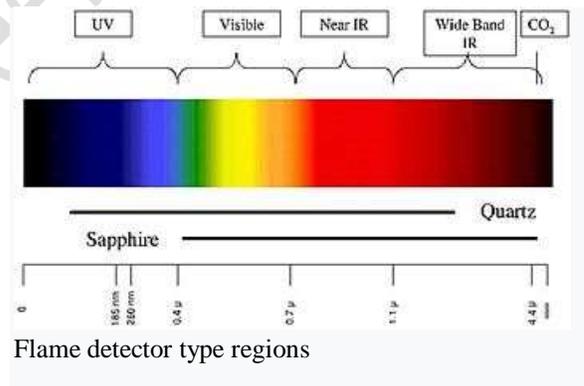
- ❖ in order to monitor the temperature continuously and compare this with the set temperature preprogrammed in the microcontroller, initially this temperature value has to be read and fed to the microcontroller. This temperature value has to be sensed. Thus a sensor has to be used and the sensor used in this project is LM35. It converts temperature value into electrical signals.
- ❖ LM35 series sensors are precision integrated-circuit temperature sensors whose output voltage is linearly proportional to the Celsius temperature. The LM35 requires no external calibration since it is internally calibrated. The LM35 does not require any external calibration or trimming to provide typical accuracies of $\pm 1/4^\circ\text{C}$ at room temperature and $\pm 3/4^\circ\text{C}$ over a full -55 to $+150^\circ\text{C}$ temperature range.
- ❖ The LM35's low output impedance, linear output, and precise inherent calibration make interfacing to readout or control circuitry especially easy. It can be used with single power supplies, or with plus and

minus supplies. As it draws only $60 \mu\text{A}$ from its supply, it has very low self-heating, less than 0.1°C in still air.

FLAME SENSOR

A **flame detector** is a [sensor](#) designed to detect and respond to the presence of a [flame](#) or [fire](#), allowing **flame detection**. Responses to a detected flame depend on the installation, but can include sounding an alarm, deactivating a fuel line (such as a [propane](#) or a [natural gas](#) line), and activating a fire suppression system. When used in applications such as industrial furnaces, their role is to provide confirmation that the furnace is working properly; in these cases they take no direct action beyond notifying the operator or control system. A flame detector can often respond faster and more accurately than a [smoke](#) or [heat detector](#) due to the mechanisms it uses to detect the flame.

Optical flame detectors



IV. PROJECT DESCRIPTION

This chapter deals with working and circuits of “ “. It can be simply understood by its block diagram & circuit diagram.

BLOCK DIAGRAM:

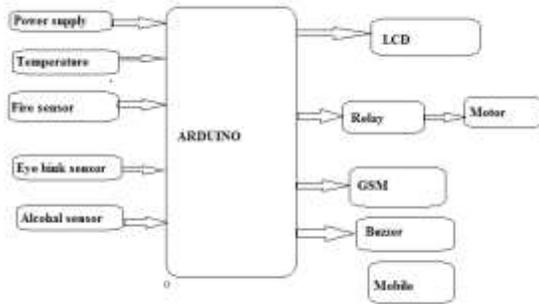


Fig.4. block diagram

SOFTWARE REQUIREMENTS:

- AURDUINO UNO

HARDWARE REQUIREMENTS:

- Power supply
- ARDUINO
- Ultra sonic SENSOR
- LCD

V. WORKING:

The device which is able to perform the task is a ARDUINO processor. The device which is able to perform the task is a ARDUINO processor. There are different sensors such as Temperature, eye blink, fire, alcohol sensors. Temperature sensor measures temperature of a person. Eye blink sensor sense when driver gone to sleep. Fire sensor for when fire occurs fire sensor will detect. Alcohol sense when the person is alcohol saved. When the one of the sensor detect motor will get off and through GSM we get the indication. All the seAll these parameters values are fed to the Arduino processor. All the parameter values are sent to the user mobile phone through message and also constantly displayed on the LCD. Then we will get the Buzzer indication also.

FLOW CHART:

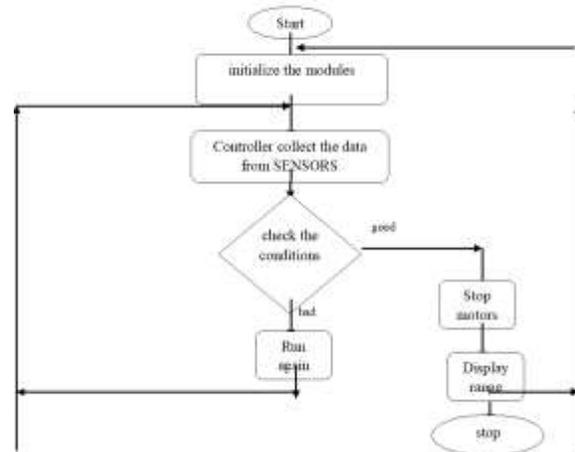


Fig 6.3. Flow chart

VI. CONCLUSION:

In this paper, we have reviewed the various methods available to determine the drowsiness state of a driver. This paper also discusses the various ways in which drowsiness can be manipulated in a simulated environment. The proposed system is used to avoid various road accidents caused by drowsy driving and also this system used for security purpose of a driver to caution the driver if any obstacle. This paper involves avoiding accident to unconsciousness through Eye blink. Here one eye blink sensor is fixed in vehicle where if driver lose his consciousness, then it alerts the driver through buzzer to prevent vehicle from accident. The alcohol and temperature sensor are used for further safety system in the vehicle. Development of a hybrid microcontroller for a vehicle which also consists of an alcohol and temperature detector which will sense if the driver is drunk and would not start the vehicle. A complete study on road safety is going to be the next boom for the automobile industry for it to flourish and survive every human from the risk. The main advantage of this paper is the accuracy of using physiological parameters to detect drowsiness is really high. This helps in preventing most of the road accidents that occur due to fatigue.

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