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AN AUTOMATIC DRIVER DROWSINESS ALERT SYSTEM BY USING GSM

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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. Drowsy is the reason for most of the road accidents. Manually tracing the drowsiness of the driver is not an easy task, because every day thousands of vehicles are running on the roads. So we need a system that must come with every car and if it detects the sleepy driver it must stop the vehicle immediately. In addition to this if the driver is slept the vehicle will be stopped. In case of emergency SMS will be sent to appropriate person.

INTRODUCTION

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. 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

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Drowsy is the reason for most of the road accidents. Manually tracing the drowsiness of the driver is not an easy task, because every day thousands of vehicles are running on the roads. So we need a system that must come with every car and if it detects the sleepy driver it must stop the vehicle immediately. In addition to this if the driver is slept the vehicle will be stopped. In case of emergency SMS will be sent to appropriate person.An embedded system is a special-purpose computer system designed to perform one or a few dedicated functions, sometimes with real-time computing constraints. It is usually embedded as part of a complete device including hardware and mechanical parts. In contrast, a general-purpose computer, such as a personal computer, can do many different tasks depending on programming. Embedded systems have become very important today as they control many of the common devices we use. Since the embedded system is dedicated to specific tasks, design engineers can optimize it, reducing the size and cost of the product, or increasing the reliability and performance. Some embedded systems are mass-produced, benefiting from economies of scale. Physically embedded systems range from portable devices such as digital watches and MP3 players, to large stationary installations like traffic lights, factory controllers, or the systems controlling nuclear power plants. Complexity varies from low, with a single microcontroller chip, to very high with multiple units, peripherals and networks mounted inside a large chassis or enclosure. In general, "embedded system" is not an exactly defined term, as many systems have some element of programmability. For example, Handheld computers share some elements with embedded systems such as the operating systems and microprocessors which power them but are not truly embedded systems, because they allow different applications to be load and peripherals to be connected.

An embedded system is some combination of computer hardware and software, either fixed in capability or programmable, that is specifically designed for a particular kind of application device. Industrial machines, automobiles, medical equipment, cameras, household appliances, airplanes, vending machines, and toys (as well as the more obvious cellular phone and PDA) are among the myriad possible hosts of an embedded system. Embedded systems that are programmable are provided with a programming interface, and embedded systems programming is a specialized occupation. Certain operating systems or language platforms are tailored for the embedded market, such as Embedded Java and Windows XP Embedded. However, some low-end consumer products use very inexpensive microprocessors and limited storage, with the application and operating system both part of a single program.

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WORKING

- We connect all the components as per the block and circuit diagrams.
- First, we switch on the power supply. Then 230 V of supply is given from the transformer to the power supply board.
- From the power supply board, power is transmitted to GSM and AURDINO boards.
- We see that the power indicators of the supply, GSM and AURDINO boards are ON, indicating that the supply is available.
- Now, the driver has to wear the Eye blink sensor spectacles.
- The IR sensor detects the movement of the eye lids.
- We observe that, as long as the driver opens his eyes, the motor runs as usual.
- If the driver closes his eye lid,
- The sensor detects the movement and sends the signal to the ULN and GSM
- Now, The ULN turns the motor OFF.
- The GSM sends a warning message to the driver that the motor is off and vehicle is stopped due to his drowsiness.
- Again, when the driver is alert, the motor starts running.
- In this way, our project, "AN AUTOMATIC DRIVER DROWSINESS ALERTING SYSTEM BY USING GSM",alerts the driver whenever he is drowsy.

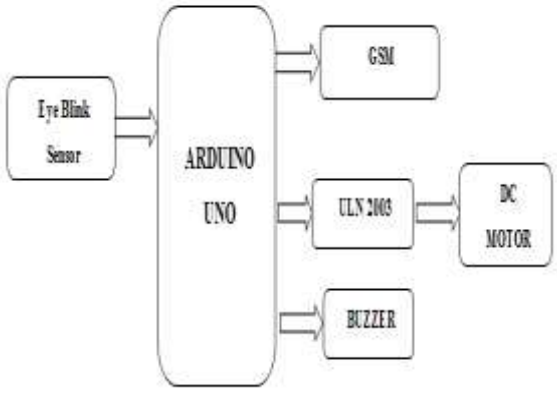

Fig.1: Block Diagram

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 a AC-to-DC adapter or battery to get started.

The Arduino Uno is a microcontroller board based on the ATmega328 (datasheet). It has 14 digitalinput/output pins (of which 6 can be used as PWM outputs), 6 analog inputs, a 16 MHz crystal oscillator, 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 a AC-to-DC adapter or battery to get started.

The Uno differs from all preceding boards in that it does not use the FTDI USB-toserial driver chip. Instead, it features the

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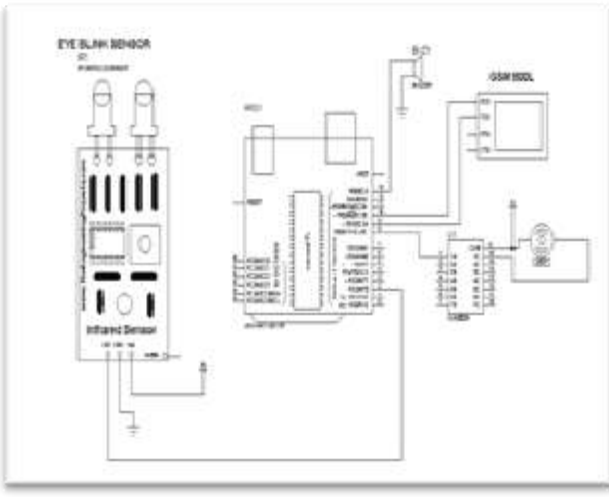
Atmega8U2 programmed as a USB-to-serial converter. "Uno" means "One" in Italian and is named to mark the upcoming release of Arduino 1.0. The Uno and version 1.0 will be the reference versions of Arduino, moving forward. The Uno is the latest in a series of USB Arduino boards, and the reference model for the Arduino platform; for a comparison with previous versions, see the index of Arduino boards.

The Arduino Uno can be powered via the USB connection or with an external power supply. The powersource is selected automatically.External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adaptercan be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from abattery can be inserted in the Gnd and Vin pin headers of the POWER connector.The board can operate on an external supply of 6 to 20 volts. If supplied with less than 7V, however, the 5Vpin may supply less than five volts and the board may be unstable.

SCHEMATIC DIAGRAM



ADVANTAGES

- Security
- Record driving data
- Analyse the accident detail
- Send location of car and its maintenance to base station through GPS and GSM technique
- Sense gas and fuel leakage
- Detect if drivers are drunk or not
- Detect if the driver is feeling sleepy

DISADVANTAGES

- Damage of sensor cannot be detected
- Lag in initialization of the GPS module

APPLICATIONS

- providing real-time drowsiness feedback to the driver,
- providing performance feedback to a fatigue management program, and/or
- Providing regulatory compliance information to enforcement officials.

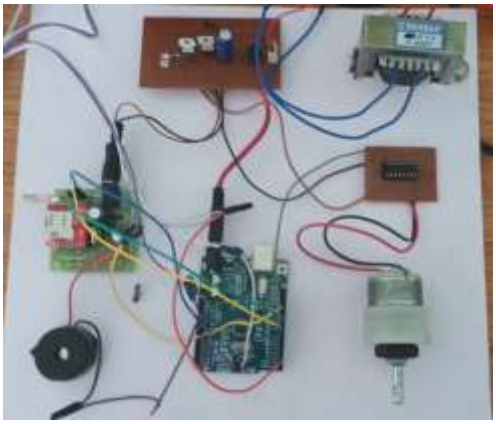


Fig.2: Photocopy of project

CONCLUSION

Thus the “Automatic Driver Alerting System by using GSM” has been designed and tested successfully. It has been developed by integrated features of all the

hardware components used. Presence of every module has been reasoned out and placed carefully, thus contributing to the best working of the unit. The system has been tested to function automatically. The IR sensor detects the movement of the eye lids. If the eye lid is detected to be closed, the IR sensor sends the signal to the microcontroller which triggers the DC motor to turn off. Otherwise, the motor runs successfully . Thus, the functionality of the entire system has been tested thoroughly and it is said to function successfully.

FUTURE SCOPE

- Capture individual drivers steering activity while drowsy
- Conduct additional simulator experiments to validate the algorithm, test additional road
- Conditions, and test a more diversified group of drivers
- Test and refine the algorithm based on the road test data. And conduct research on warning systems integrated with the detection system.

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