International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
IJARST
ISSN: 2457-0362

VEHICLE ACCIDENT AVOIDANCE WITH ROAD ADVERSE CONDITIONS MONITORING

Kancharla Suresh, Assistant Professor, Dept. of ECE, St.Martin's Engineering College
Sireesha Pendem, Associate Professor, Dept. of ECE, CMR Technical Campus
Nazia Shabana, Assistant Professor, Dept. of ECE, Swami Vivekananda Institute of Technology

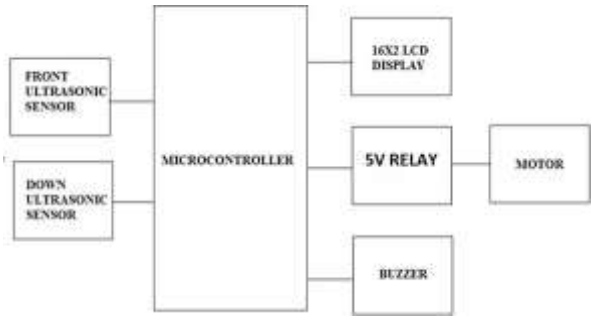
ABSTRACT

The main aim of this project is to design the vehicle accident avoidance with roadadverse conditionsmonitoring. considering the increasing number of traffic accidents in recent years, it is beingaccepted that traffic accidents have assumed exceptional dimension of a serious problem. Ofthe major causes of accidents, the driver has been recognized as the main cause of accident.As regards tohuman factor, itis concluded that not so much can be done toimprove thelevel of alertness of drivers or reduce the level of stress experienced by drivers. Hence,Intelligent System is being deployed to vehicles to aid drivers to avoid collision. ExistingCollision Detection and Avoidance systems have grown in complexity that the goal of easy integration and maintain abilityiselusive

.

INTRODUCTION

The main aim of this project is to design the vehicle accident avoidance with road adverse conditions monitoring.Considering the increasing number of traffic accidents in recent years, it is being accepted that traffic accidents have assumed exceptional dimension of a serious problem. Of the major causes of accidents, the driver has been recognized as the main cause of accident. As regards to human factor, it is concluded that not so much can be done to improve the level of alertness of drivers or reduce the level of stress experienced by drivers. Hence, Intelligent System is being deployed to vehicles to aid drivers to avoid collision. Existing Collision Detection and Avoidance systems have grown in complexity that the goal of easy integration and maintainability is elusive.



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,

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

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.

The Arduino Uno can be powered via the USB connection or with an external power supply. The power source is selected automatically. External (non-USB) power can come either from an AC-to-DC adapter (wall-wart) or battery. The adapter can be connected by plugging a 2.1mm center-positive plug into the board's power jack. Leads from a battery 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. If using more than 12V, the voltage regulator may overheat and damage the board. The recommended range is 7 to 12 volts.

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.

In this project we using step-down transformer which converts 230V AC to 12V AC [or] 230V

The purpose of a rectifier is to convert an AC waveform into a DC waveform (OR) Rectifier converts AC current or voltages into DC current or voltage. There are two different rectification circuits, known as 'half-wave' and 'full-wave' rectifiers. Both use components called diodes to convert AC into DC.

When the AC input is positive, diodes A and B are forward-biased, while diodes C and D are reverse- biased. When the AC input is negative, the opposite is true - diodes C and D are forward-biased, while diodes A and B are reverse-biased. While the full-wave rectifier is an improvement on the half-wave rectifier, its output still isn't suitable as a power supply for most circuits since the output voltage still varies between 0V and Vs-1.4V. So, if you put 12V AC in, you will 10.6V DC out.

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
ISSN: 2457-0362

A liquid crystal display (LCD) is a thin, flat display device made up of any number of color or monochrome pixels arrayed in front of a light source or reflector. Each pixel consists of a column of liquid crystal molecules suspended between two transparent electrodes, and two polarizing filters, the axes of polarity of which are perpendicular to each other. Without the liquid crystals between them, light passing through one would be blocked by the other. The liquid crystal twists the polarization of light entering one filter to allow it to pass through the other.

A program must interact with the outside world using input and output devices that communicate directly with a human being. One of the most common devices attached to an controller is an LCD display. Some of the most common LCDs connected to the 20ontrollers are 16X1, 16x2 and 20x2 displays. This means 16 characters per line by 1 line 16 characters per line by 2 lines and 20 characters per line by 2 lines, respectively.

The switches must be the type where On = 0, so that when they are turned to the zero position, all four outputs are shorted to the common pin, and in position "F", all four outputs are open circuit.

All the available characters that are built into the module are shown in Table 3. Studying the table, you will see that codes associated with the characters are quoted in binary and hexadecimal, most significant bits ("left-hand" four bits) across the top, and least significant bits ("right-hand" four bits) down the left.

Most of the characters conform to the ASCII standard, although the Japanese and Greek characters (and a few other things) are obvious exceptions. Since these intelligent modules were designed in the "Land of the Rising Sun," it seems only fair that their Katakana phonetic symbols should also be incorporated. The more extensive Kanji character set, which the Japanese share with the Chinese, consisting of several thousand different characters, is not included!

Using the switches, of whatever type, and referring to Table 3, enters a few characters onto the display, both letters and numbers. The RS switch (S10) must be "up" (logic 1) when sending the characters, and switch E (S9) must be pressed for each of them. Thus the operational order is: set RS high, enter character, trigger E, leave RS high, enter another character, trigger E, and so on.

Arduino IDE

Arduino is a prototype platform (open-source) based on an easy-to-use hardware and software. It consists of a circuit board, which can be programmed (referred to as a microcontroller) and ready-made software called Arduino IDE (Integrated Development Environment), which is used to write and upload the computer code to the physical board.

The key features are:

- By sending a set of instructions to the microcontroller on the board via Arduino IDE (referred to as uploading software).
- Arduino boards are able to read analog or digital input signals from different sensors and turn it into an output such as activating a motor, turning LED on/off, connect to the cloud and many other actions.

International Journal For Advanced Research In Science & Technology
A peer reviewed international journal www.ijarst.in
IJARST
ISSN: 2457-0362

• You can control your board functions Unlike most previous programmable circuit boards, Arduino does not need an extra piece of hardware (called a programmer) in order to load a new code onto the board. You can simply use a USB cable.

• Additionally, the Arduino IDE uses a simplified version of C++, making it easier to learn to program.

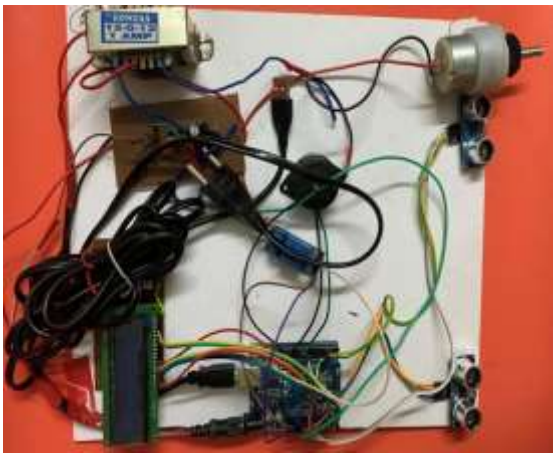
• Finally, Arduino provides a standard form factor that breaks the functions of the micro-controller into a more accessible package.

After learning about the main parts of the Arduino UNO board, we are ready to learn how to set up the Arduino IDE. Once we learn this, we will be ready to upload our program on the Arduino board.

WORKING

This project has developed a system to achieve a Low Cost but highly reliable Vehicular Accident Detection and Avoidance System using Ultrasonic Sensors installed at the front of the vehicle. Our project uses Arduino board which consists of ATmega328 Micro Controller. The use of microcontroller for the generation of ultrasonic signal and the control logic enables the prediction of imminent collision when the vehicle approaches an obstacle within range, thereby enabling some controls which ensure a warning alarm. With the embedded C program in the microcontroller, a visual liquid crystal display is equally incorporated to give situation report of the device surveillance activities.

We are adding one more sensor to the circuit, to identify the road conditions in the bottom. Along with front ultrasonic sensor there is also down ultrasonic sensor which is used to detect the road adverse conditions like dicks or speed breakers on the road, the vehicle speed will be slow down automatically.



CONCLUSION

Thus the "VEHICLE ACCIDENT AVOIDNCE WITH ADVERSE CONDITIONSMONITORING SYSTEM" 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 two Ultrasonic sensors ie, front Ultrasonic sensor and down Ultrasonic sensor are used to detect the road adverse conditions like dicks or speed breakers on the road, the vehicle speed will be slow down automatically. This system is used to reduce the major causes of accidents. Our project can be considered as an intelligent system is being deployed to vehicles to aid drivers to avoid collision.

REFERENCES

[1]S. Kang, S.M. Lee, T.J. Kimn A GIS-based traffic accident analysis on highways using alignment related risk indices.

[2] Steinset, BK. January 1998, Traffic Data Collection in Botswana. Fact Finding Appraisal report. NPRA.

[3]Steinset. BK. June 1998. Report of a visit to Roads Department, Botswana. NPRA.

[4]TRL, July 1994. Review of Weighbridge Operation and Traffic Data Collection, Botswana Final Report (1994).