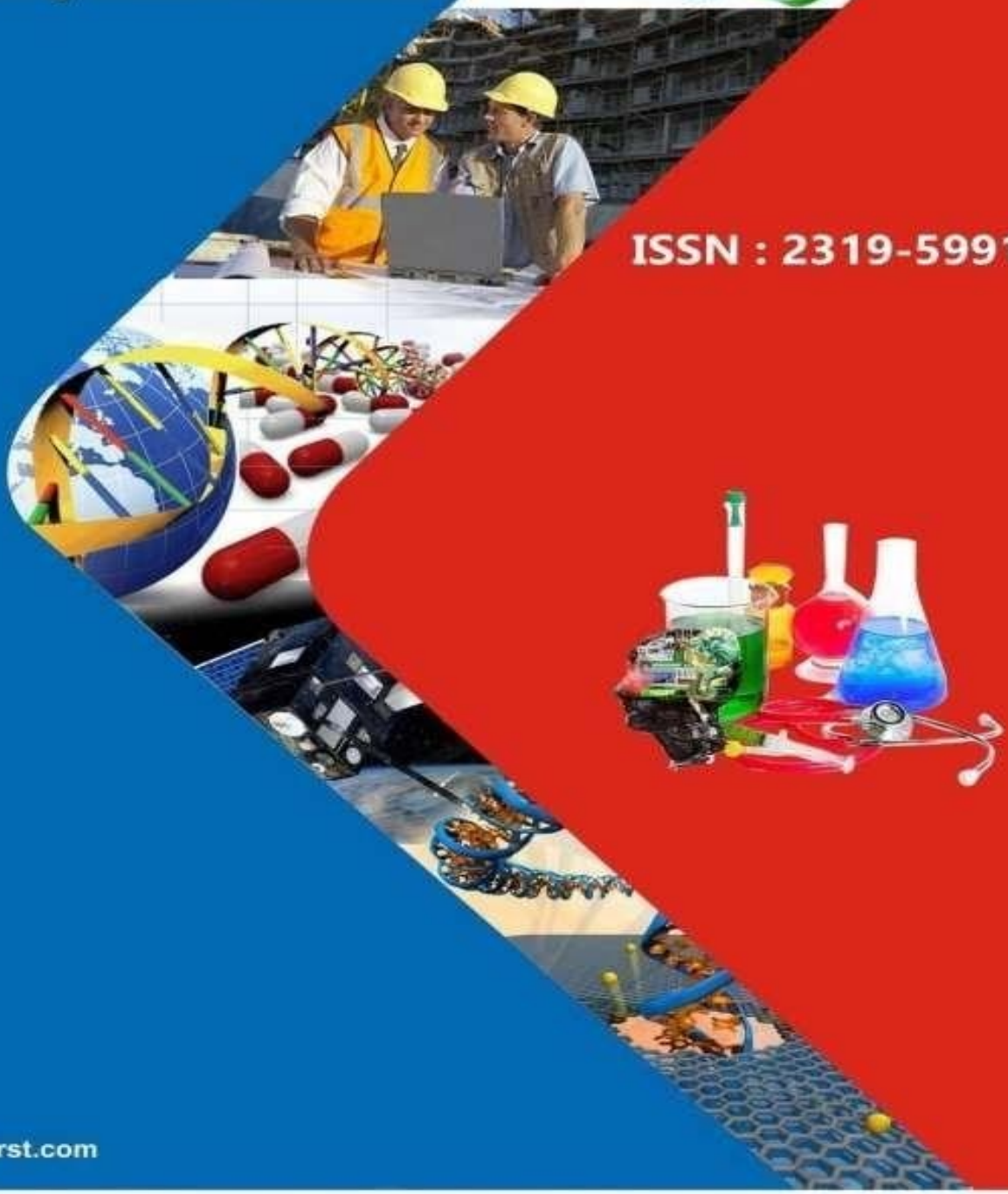
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RASH DRIVING DETECTION AND VEHICLE COLLISION AVOIDANCE SYSTEM

[1]Mr.B.Obulareddy,M.Tech,Assistant Professor,
[2]K.Kusumambika, [3]M.Sai Chinmai, [4]G.Chinna Obulesu, [5]G.Vamsidhar Reddy
DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING
CHAITANYA BHARATHI INSTITUTE OF TECHNOLOGY
VIDYA NAGAR, PALLAVOLU (V), PRODDATUR-516360, Y.S.R (Dt.), AP

ABSTRACT

Road safety is a growing concern due to the increasing number of vehicles and incidents caused by rash driving. This automatically switches the high beam into low beam thus reducing the glare effect by sensing the approaching vehicle. It also eliminates the requirement of manual switching by the driver which is not done at all times.As the number of vehicles increasing day-by-day, accidents are also increasing rapidly. These accidents can be due to false estimation of nearby vehicles, disturbances in mind of driver or any reasons due to which driver can't keep focus on driving. The project is based on the accident. This system can measure the distance between the driving car and front object and can calculate the safety distance of driving car based on its current speed. If driver doesn't keep the minimum safety with front object, it will warn the driver to slow down the speed of car to avoid collision. And if the driver doesn't slow down the car, this system will automatically slows down and stop the car before the collision could occur..

Keywords: Collision, sensors, autobraking, safety, warning. Microcontroller, Speed, Distance, L293D Motor Driver, Ultrasonic sensor, LCD Display, Buzzer, Limit Switch.

I. INTRODUCTION

1.1 INTRODUCTION

Microcontroller are widely used in Embedded Systems products. An Embedded product uses the microprocessor (or microcontroller) to do one task & one task only. A printer is an example of Embedded system since the processor inside it perform one task only namely getting the data and printing it. Although microcontroller is preferred choice for many Embedded systems, there are times that a microcontroller is inadequate for the task. For this reason, in recent years many manufactures of general-purpose microprocessors such as INTEL, Motorola, AMD & Cyrix have targeted their microprocessors for the high end of Embedded market. One of the most critical needs of the embedded system is to decrease power consumptions and space. This can be achieved by integrating more functions into the CPU chips. All the embedded processors have low power consumptions in additions to some forms of I/O, ROM all on a single chip. In higher performance Embedded system, the trend is to integrate more & more function on

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the CPU chip & let the designer decide which feature he/she wants to use.

1.2 EMBEDDED SYSTEM

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 loaded and peripherals to be connected. Embedded systems span all aspects of modern life and there are many examples of their use. Telecommunications systems employ numerous embedded systems from telephone switches for the network to mobile phones at the end-user. Computer networking uses dedicated routers and network bridges to route data.

EXAMPLES OF EMBEDDED SYSTEM:

Automated teller. machines (ATMS). Integrated system in aircraft and missile. Cellular telephones and telephonic switches. Computer network equipment, including routers timeservers and firewalls. Computer printers, Copiers. Disk drives (floppy disk drive and hard disk drive). Engine controllers and antilock brake controllers for automobiles. Home automation products like thermostat, air conditioners sprinkles and security monitoring system. House hold appliances including microwave ovens, washing machines, TV sets DVD layers/recorders. Medical equipment. Measurement equipment such as digital storage oscilloscopes, logic analysers and spectrum analysers. Multimedia appliances: internet radio receivers, TV set top boxes.Small hand-held computer with P1M5 and other applications. Programmable logic controllers (PLC's) for industrial automation and monitoring. Stationary video game controllers.

1.3 CHARACTERISTICS:

Embedded systems are designed to do some specific tasks, rather than be a general-purpose computer for multiple tasks. Some also have real-time performance constraints that must be met, for reasons such as safety and usability; others may have low or no performance requirements, allowing the system hardware to be simplified to reduce costs. Embedded systems are not always standalone devices. Many embedded systems consist of small, computerized parts within a larger device that serves a more general purpose. For example,

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the Gibson Robot Guitar features an embedded system for tuning the strings, but the overall purpose of the Robot Guitar is, of course, to play music. Similarly, an embedded system in an automobile provides a specific function as a subsystem of the car itself.

The software written for embedded systems is often called firmware, and is usually stored in read- only memory or Flash memory chips rather than a disk drive. It often runs with limited computer hardware resources: small or no keyboard, screen, and little memory.

1.4 MICROPROCESSOR (MP):

A microprocessor is a general-purpose digital computer central processing unit (CPU). Although popularly known as a "computer on a chip" is in no sense a complete digital computer. The block diagram of a microprocessor CPU is shown, which contains an arithmetic and logical unit (ALU), a program counter (PC), a stack pointer (SP), some working registers, a clock timing circuit, and interrupt circuits.

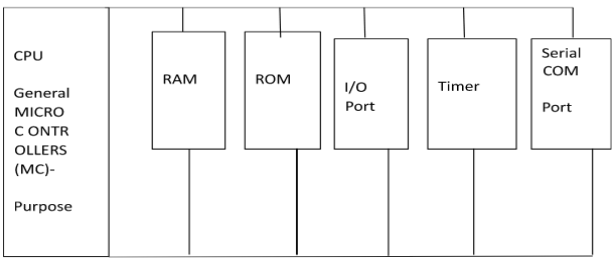


Fig 1.1 Block diagram of microprocessor

1.5 MICROCONTROLLER (MC):

Figure shows the block diagram of a typical microcontroller. The design incorporates all of the features found in micro-processor CPU: ALU, PC, SP, and registers. It also added the other features needed to make a complete computer: ROM, RAM, parallel I/O, serial I/O, counters, and clock circuit.

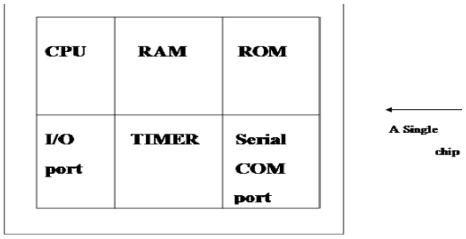


Fig 1.2 Microcontroller

1.6 COMPARISION BETWEEN MICROPROCESSOR AND MICROCONTROLLER

The microprocessor must have many additional parts to be operational as a computer whereas microcontroller requires no additional external digital parts. The prime use of microprocessor is to read data, perform extensive calculations on that data and store them in the mass storage device or display it. The prime functions of microcontroller is to read data, perform limited calculations on it, control its environment based on these data. Thus the microprocessor is said to be general-purpose digital computers whereas the microcontroller are intend to be special purpose digital controller. Microprocessor need many opcodes for moving data from the external memory to the CPU, microcontroller may require just one or two, also microprocessor may have one or two types of bit handling

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instructions whereas microcontrollers have many.

II. LITERATURE SURVEY

2.1 INTRODUCTION

Collision avoidance systems concentrates on advanced ideas such as pre-crash sensing, an ultrasonic sensor is used to sense the object in front of the vehicle and gives the signal to the microcontroller unit. Based on the signal received from the ultrasonic sensor, the microcontroller unit sends a signal to the braking unit for applying the brake automatically. A collision avoidance system, also known as a pre-crash system, forward collision warning system, or collision mitigating system, is an automobile safety system designed to prevent or reduce the severity of a collision.It uses radar (all-weather) and sometimes laser (LIDAR) and camera (employing image recognition) to detect an imminent crash. GPS sensors can detect fixed dangers such as approaching stop signs through a location database. Once an impending collision is detected, these systems provide a warning to the driver. When the collision becomes imminent, they take action autonomously without any driver input (by braking or steering or both). Collision avoidance by braking is appropriate at low vehicle speeds (e.g. below 50 km/h (31 mph)), while collision avoidance by steering may be more appropriate at higher vehicle speeds if lanes are clear. Cars with collision avoidance may also be equipped with adaptive cruise control, using the same forward-looking sensors..

III. PROBLEM STATEMENT

In the existing system, the systems sound an alarm to notify drivers that a collision may be imminent a sound simply to alert the driver and get him or her ready to take evasive action. The accidents are mostly cause by delay of the driver to hit the brake.An Automated anti-collision system that can detect only obstacles by sharp distance sensor, sends alerts in case the vehicle is in close distance of collision and attempts to stop the vehicle without the help of driving person, has been proposed in.The researchers in aims to design an smart vehicle system that can detect any abnormal condition or accident by sensing various parameters from the seat belt sensor, vehicle black box and the eye blink sensor placed within the vehicle and can automatically inform the traffic police as well as the relatives of the driver about the location of accident via GSM/GPRS technology in case some accident occurs. One off the major reasons behind the road accidents is driver's inattention towards the road while driving due to their fatigue and drowsiness. The authors in have reviewed various driver alert systems that assists us to prevent or avoid the collisions on road by applying technologies like digital image processing, electrocardiogram, electroencephalogram etc

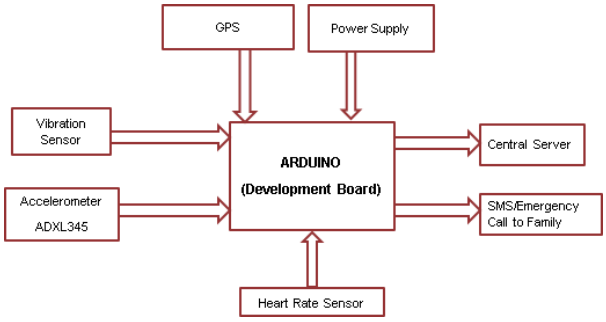
3.1 BLOCK DIAGRAM OF EXISTING SYSTEM

shows block diagram of existing system

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Block diagram of Existing System

3.1 Disadvantages of Existing System:

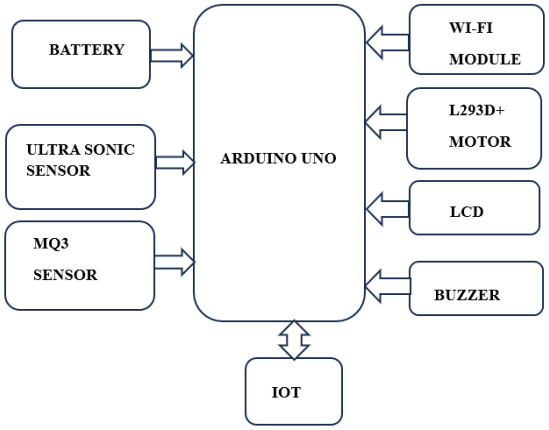
If the driver does not intervene in spite of the warning there is a possibility of collision. Depends on human responsiveness. Negligence can lead to accident. Does not ensure total security.

IV. PROPOSED SYSTEM

The main purpose of the system is to detect and avoid the collision thus preventing the accident We propose a new system in which the user driving the vehicle will be registered to an application in android device, smart phone etc. Android application will be connected to microcontroller through Bluetooth module. When the user has turned on the application it will be continuously monitoring the system. Thus, this new system is designed to solve the problem where drivers may not be able to brake manually exactly at the required time, but the vehicle can still stop automatically by sensing the obstacles to avoid an accident.

4.1 BLOCK DIAGRAM OF PROPOSED SYSTEM

shows the block diagram of proposed system. The proposed system contains different modules consisting of both hardware and software components



V. BLOCK DIAGRAM OF PROPOSED SYSTEM

HARDWARE COMPONENTS

Battery,Arduino UNO,Ultrasonic Sensor,MQ3 Sensor,Wi-Fi, Module,L293D,Motor,LCD,Buzzer

SOFTWARE COMPONENTS

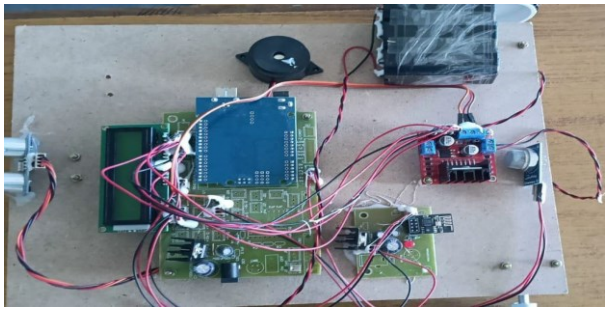
The following software tools used in the proposed system

Arduino IDE, Proteus Design Tool

VI. RESULT AND DISCUSSION

6.1 PROTOTYPE (THROUGH KIT)

shows the prototype of the project

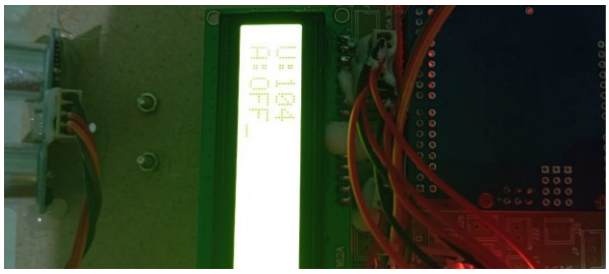


shows the ultra sonic sensor ranges

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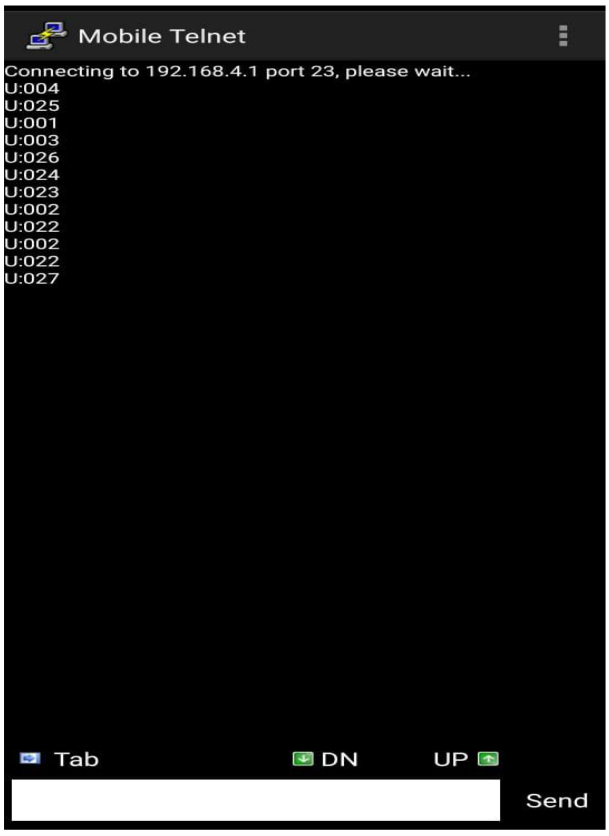
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Prototype of the Project

EXPERIMENTAL RESULTS

shows the real-time ultra sonic sensor ranges



Realtime ultra sonic sensor ranges

VII. CONCLUSION AND FUTURE SCOPE

The design and its implementation of PIC microcontroller-based Vehicle Collision Avoidance System are effectively carried out with the advantages in providing the speed control of cars in traffic, and for the safety of cars and drivers and has proved to be more reliable and easy to operate. This project is also shows how the speed of vehicle can be monitored by the sensors and also protect it in case of any fault and will prevent the vehicle from getting damaged and also obtained various conditions of detection of obstacles by giving different inputs to the microcontroller.

VIII. FUTURE SCOPE

The main objective of this system is to apply automotive vehicle. To move the headlight along with steering on sharp turning.To keep the headlight, beam parallel to road turning as possible as can. · To change the place of area illuminated by headlight and direct illumination area of headlight in useful direction.To improve the visibility area of driver at night so that driver can judge road turning well.

To prevent road accidents on sharp turning at night specially in hilly areas.

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