

Driver Assistance System

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Abstract - Advancement in technology is affecting almost all the fields and automotive doesn't remain untouched. Every automobile manufacturer spends millions in development of cutting edge technologies to employ their vehicles with latest technology innovations to keep drivers safe, accident free and give them a better driving experience. These technologies are known in the industry as Advanced Driver Assistance Systems and these are controlled by real-time embedded systems. This paper will present a new method for Driver Assistance System.

Keywords - Arm Cortex M0 Nuvoton Development Board, UltraSonic Sensor, IR Proximity Sensor, C Language

I. INTRODUCTION

Based on latest reports nearly 1.3 million people die every year due to road accidents and 20 to 50 million peoples suffer critical non-mortal injuries. This can be due to the state of roads being overcrowded, especially with traffic and rash driving.

Driver assistance system uses technology to automate, adapt and enhance systems for safer and better driving experience. Avoiding collision by introducing technology to increase safety is one the main role of DAS. Driver assistance system is a system that assists the driver for safer and better driving experience. The driver assistance system has the key feature to sense, predict and analyse the road environment. The evolution in science and technology has increased level of automation in every field. For Automobile application security plays an important role in the field of autonomous vehicles, but also economy is important.

So, nowadays aim of automobile manufacturers is to build intelligent cars that will indicate us about danger and help us in difficult road situations.

II. PROPOSED SYSTEM

Because different scenarios need different assistance, the proposed system will have two different modes. 1. City mode 2. Highway mode

1. In city mode, the major issue solved in this paper is (a) noise pollution and (b) close obstacles IR transceivers are used in for communication between vehicles instead of horns this will reduce noise pollution. Vehicle in the back can transmit a signal by IR transmitter and vehicle in front will receive that signal by IR receiver, a buzzer inside the vehicle will point the driver about the vehicle in behind. Exact distance of obstacles if known can help drivers to escape close encounters in narrow passages. Ultraviolet sensor can be used for obstacle distance finding.
2. In highway mode, the major issue solved in this paper is overtaking vehicles. Two IR proximity sensors employed at back of vehicles will detect if any vehicle is overtaking from either side

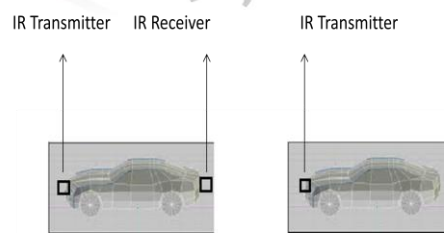


Fig.1.IR Transceiver

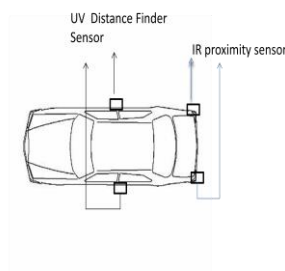


Fig.2 IR proximity sensors and UV sensors

III. METHODOLOGY

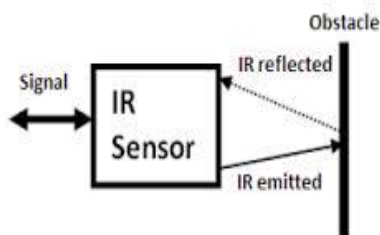


Fig.3. IR Sensor

An IR sensor is an instrument which is useful in sensing some desired characteristics of surroundings by either detecting or emitting infrared radiation. They are capable of measuring the heat emitted by an object and detecting motion.

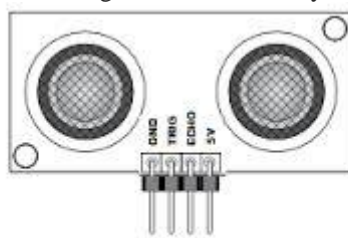


Fig.4. Ultrasonic Sensor

Working of ultrasonic sensors are same as radar or sonar, which helps in attributing certain target by interpreting the echoes from radio or sound waves respectively. Some of the Active sensors generate high frequency sound waves and evaluate the echo which is received back by the sensor while Passive ultrasonic sensors are basically used in microphones that can detect ultrasonic noise.

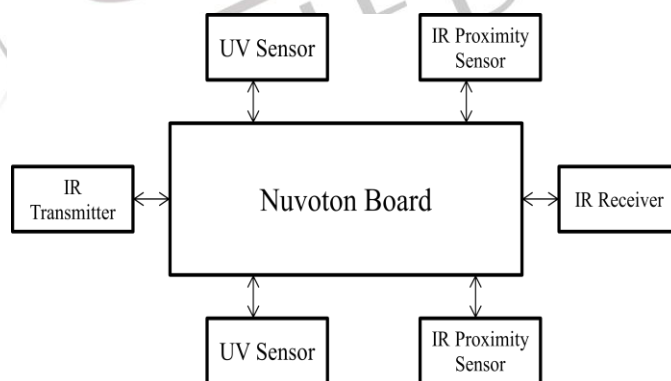


Fig 5 .Block Diagram

In this project we are using Nuvoton development board, it is having a arm cortex M0 microcontroller which is suitable for automotive application. In this system, we are using three types of sensor IR proximity sensor , ultrasonic SR04 sensor and IR sensor as a transmitter and receiver. All these sensors are connected to UART port of Nuvoton board to serially transmit and receive data.. So it can assist the driver to drive safely. And if car comes in range of other car all sensors send data to Nuvoton board.

IV. CONCLUSION

The Driver assistance system is based on two different driving scenarios hence proposed system works in two different mode. Because of this proper issues regarding specific scenarios can be solved.

So this can be concluded that this system is economic and when employed on automobile will make it safer and will enhance the driving experience.

V. FUTURE SCOPE

Enhancement in technology has seen development in sensors; many more sensors can be employed into automobile to make it more intelligent. Camera can be added with image processing application that can facilitate many more features. Autopilot mode and cruise mode can further enhance driving experience. Blind spot indicator system and cross traffic alert system can reduce accidents. CAN protocol with Ethernet can increase assistance. Alcohol Ignition interlock devices can be employed so that a drunken driver could not start engine.

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