

SMART SYSTEM TO PREVENT ACCIDENT IN VARIOUS ZONES

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ABSTRACT

This smart system approaches towards vehicle navigation & safety implementation in U turns. This system aimed at automatic speed sensing of vehicles near zones like schools, U turns and hilly areas. For example like school (or) hospital zones have SIGN BOARD near speed breakers to drive slowly. It is usually ignored by the drivers. Many accidents are occurring due to the close running of vehicles. All of a sudden, if the in front vehicle driver reduces the speed or applied brakes especially in U turns, then it is somewhat complicated to the following vehicle driver to direct his vehicle, followed by an accident. To stay away from this kind of accident, the warning system, which contains alarm and display system can arrange at rear surface of each and every vehicle. In this proposed system the vehicle is inbuilt with ultrasonic sensor, vibration sensor and relay controller for monitoring speed which is run by drive circuit along with line follower by using embedded system. Ultrasonic sensor senses the distance at which vehicle is arriving near U turns or curves and transmits the signal to the controller. The controller in turn sends a signal to drive circuit which operates the motor and reduces the vehicle speed automatically and also makes the LED to glow and gives an alert signal to the concerned vehicle.

Keywords – Ultrasonic Sensors, Vibration Sensors, Microcontroller, Line follower, Encoder, Decoder.

I. INTRODUCTION

Our society is facing lot of problems at present and the major problem is accident. Driving is an unavoidable activity for most people. At present the number of vehicle is ever-increasing day by day. It is produced tacked tightly and risk to accident. Currently, the records of accident are so high and timidly. Accident will occur all the time and all over the place and cause worst damage, serious injury and dead. Accidents are quite common on Roads. Additionally with the rapid urbanization, India has seen an un-precedent growth of motor vehicles. Presently motor vehicle accidents position ninth in order of disease burden and are expected to be ranked third in the year 2020. Globally, the number of people killed in road traffic crashes each year is likely at almost 1.2 million, while the number injured could be as high as 50 million. In India, over 80,000 persons die in the traffic crashes annually, over 1.2 million are wounded seriously and about 300000 disabled permanently Safety studies have found that a most of the accidents occur either due to the driver's error or due to the inattention of the safety norms. The statistics show that more number of road accidents takes place at blind road corners or 'U' turns where we are not able to visualize the incoming vehicle and over speed of vehicle. Vehicles taking a turn assuming that no other vehicle is at the contrary end cause major road accidents and results in maximum deaths.

II. EXISTING SYSTEM

The existing system consists of IR sensor and LED connected through ATMEGA328P microcontroller. This system only intimates U turns and curves. At present the vehicles arriving at both the sides in U turns can be detected only by vehicle sound horn. Whenever the vehicle met with any accident the sensor will detect the vibration depending upon the crashes. Afterwards the sensed vibration will send a signal to microcontroller/chip to detect the location of the accident. The main purpose of the controller is used to trace the place at which accident occurs by using GPS.

III. PROPOSED SYSTEM

The proposed system consist of ultrasonic sensor, vibration sensor, RF transceiver, voice board, LED and line follower are connected through PIC16F877A microcontroller. The main idea of this project is to detect vehicles near 'U' turns and automatically reduce the vehicle speed in order to avoid accidents. Ultrasonic sensors will recognize the vehicles at a certain distance and sends a signal to the microcontroller through transmitter. The controller works with priority algorithm and in turn provides a signal to drive circuit by means of receiver. This in turn makes the motor to operate and automatically controls the vehicle speed. It also makes either one of the vehicle on 'U' turn to divert from its normal path to another runway with the help of line follower. The output of the controller also makes the LED to glow that insists an alert signal to drivers. The LED is normally green colour on both side and if a vehicle is arriving at one side, the colour of LED changes to red on another side to intimate the vehicles.

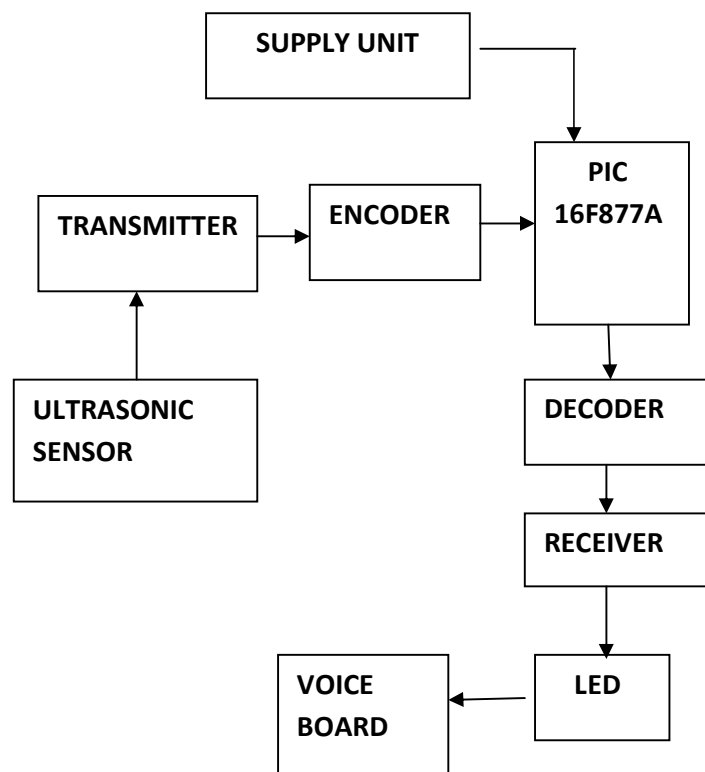


Fig 3.1 Block diagram for U turns

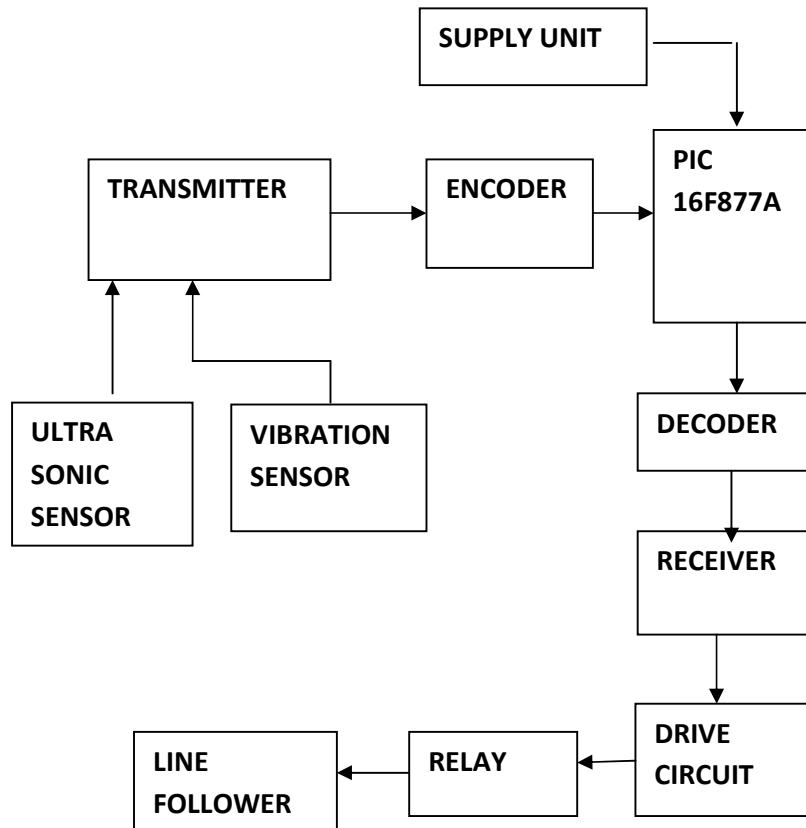


Fig 3.2 Block diagram for vehicle speed control

3.1 Ultrasonic Sensors

Ultrasonic sensors are used to determine the distance by means of ultrasonic waves. The sensor top emits an ultrasonic wave and receives the wave reflected back from the object. Ultrasonic Sensors measure the distance to the object by measuring the time between the discharge and response.

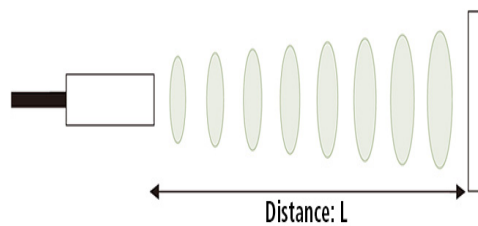


Fig 3.3 Ultrasonic sensors

The difference between an optical sensor and ultrasonic sensor is that the optical sensor consists of both transmitter and receiver, while an ultrasonic sensor uses a single ultrasonic element for both emission and reception. The reflective model ultrasonic sensor has a single oscillator that emits and receives ultrasonic waves alternately. This enables miniaturization of the sensor head.

3.2 Vibration Sensors

These sensors work on the principle of piezoelectric effect. It is used to measure the changes in pressure, acceleration, temperature, strain or force by converting them to an electrical charge. This electrical signal will be given to the controller through transmitter and encoder and the output of the controller will be decoded. The decoded signal will be received by the driver circuit thereby relay operates and an output signal will be intimated to the driver.

3.3 Line Follower

Line follower is an independent robot and it must be capable of identifying particular line and keep on following it. The sensor mechanism is used to detect reflected light approaching from its own infrared LED. In this line follower, the proximity sensor is used for path detection and IR sensor used for obstacle detection. These sensors are inbuilt at the front end of the robot. The microcontroller is a logical device and the complete function is controlled by it.

IV. HARD WARE RESULTS

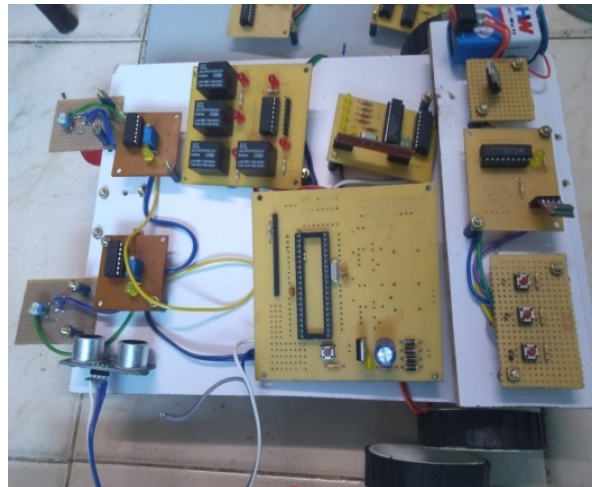


Fig4.1 Hardware model For U turn

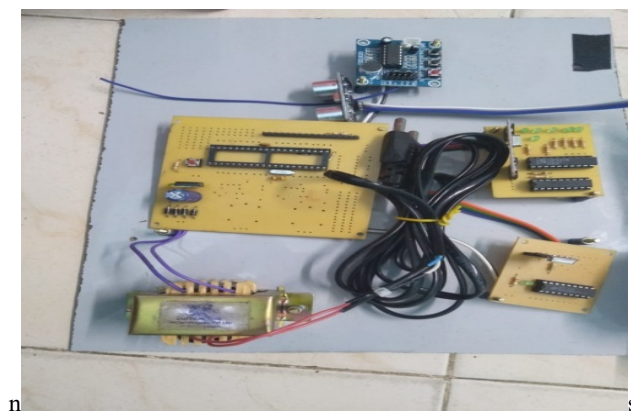


Fig4.2 Hardware model for vehicle speed control

V.CONCULSIONS

This project describes the avoidance of accident due to the lack of care of the driver. This project will be the perfect substitute to the existing mirror setup arrangement. The replacement of mirror setup by the Ultrasonic sensor provides a better output as it is given to the microcontroller for further process. The programming code written in the controller is embedded C basic language which is compiled using the compiler. The output for U turn's navigation and speed control of vehicle are obtained. The vibration sensor used to intimate earthquake while driving. The system is used to prevent accident and save human life.

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