Enhanced vision system

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Abstract- The idea behind this paper is to implement a better vision system. This project consists of a microcontroller, ultrasonic sensor, camera along with a IR sensor, LCD and a computer set. It will help the viewer have a better site of the objects on his way. This project will work as a vision aid to any driver. It will indicate if there are any obstacles in the way and at what distance the obstacle is. This system will have a Atmega8 microcontroller which will control the basic working of the sensors. And with the help of some sensors a power supply this system shall provide with the required data.

1. Introduction

The number of vehicles now a days are increasing rapidly and with that the number of accidents are also increasing. This is majorly because we have limitations to our senses like at night we can't see properly or if the weather is too fogy. So using this proposed system we can help one see better. This system will help reduce number of accidents and even bring a little ease to the driver. It is important for the vehicle to stay in a single lane this purpose can be fulfilled by this device. A buzzer is also installed so if any obstacle is nearing the vehicle than the intensity of the buzzer will go on increasing. With the combined effect of a better view and sound one can get a better idea of their surroundings. This system will help in keeping the roads safe. Having a whole dedicated system to help out the driver is a comforting factor to the driver as well.

Proposed system and working

The aim of this system is to provide a better vision to the driver using some sensors. This system consists of ultrasonic sensor, a camera along with infrared sensor, a microcontroller and a power supply. Using an ultrasonic sensor we can measure the distance of any obstacle in its way. Infrared sensor helps in night vision along with a camera.

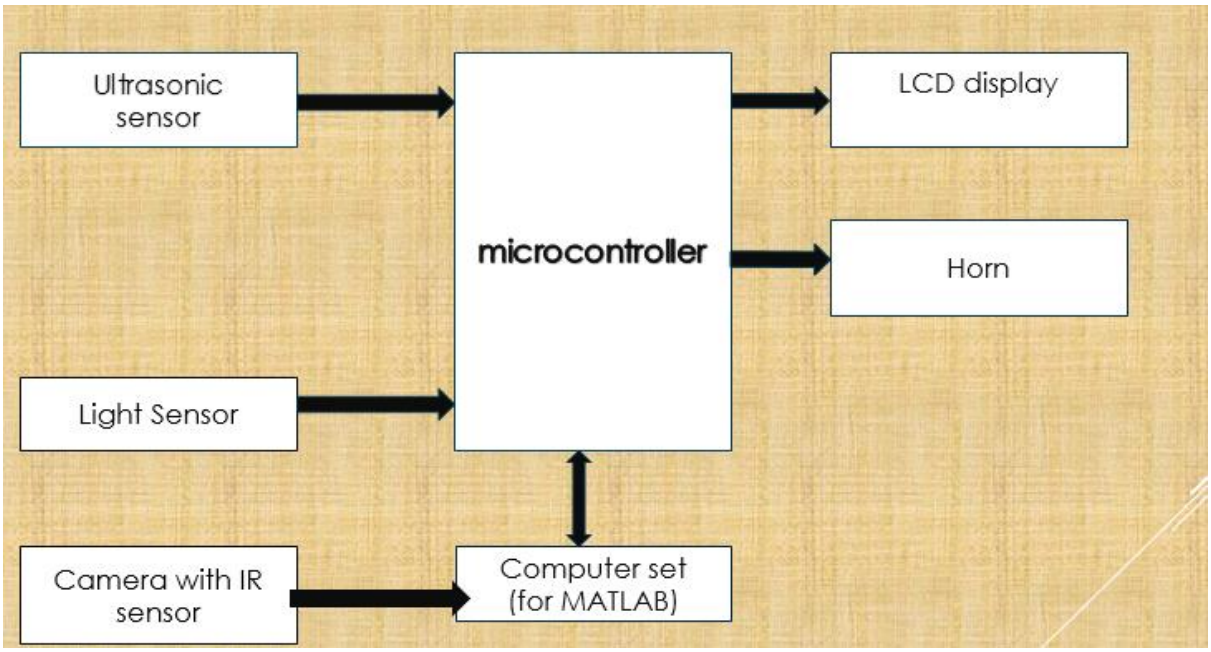
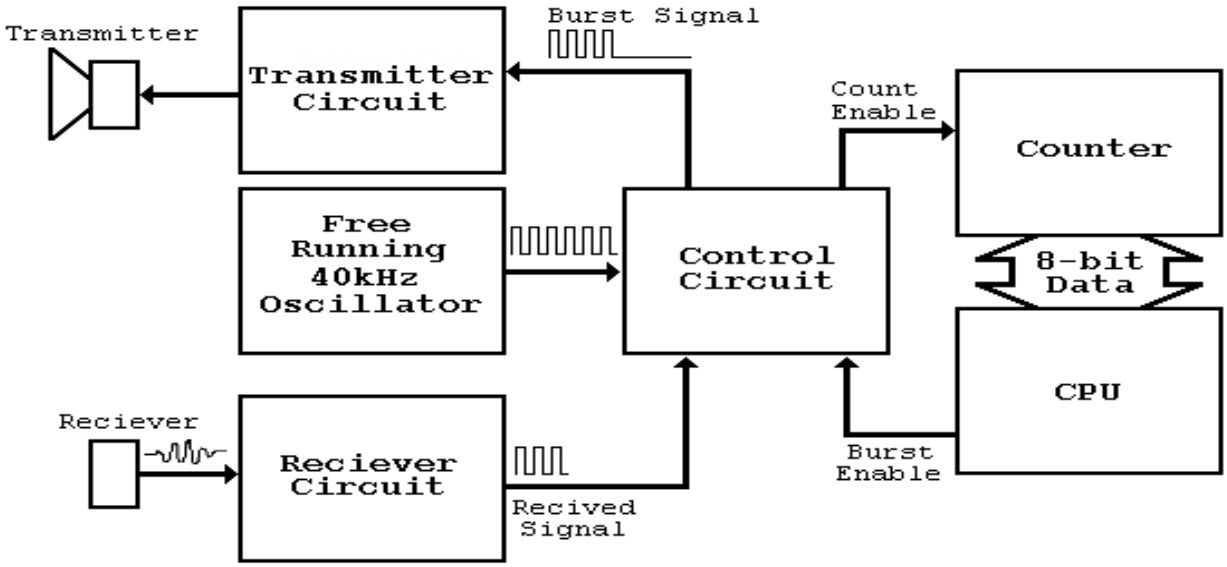


Fig1. Block diagram

The basic working of the system will be controlled by an atmega8 microcontroller which will take care of the process taking place in the system. All the data that the sensors will receive will be given to the microcontroller which will work as a coordinator between sensors and the display. Also a power supply is provided to this system so this system is mobile.

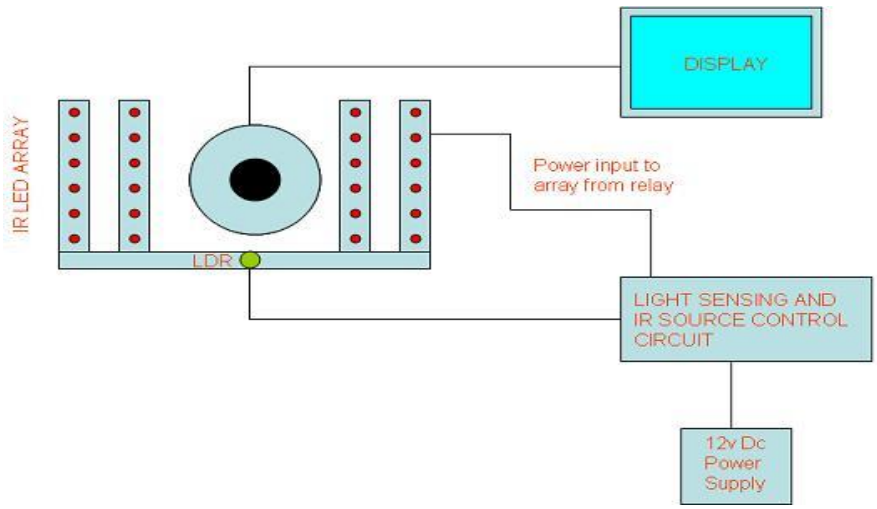
1.1 Obstacle detection-

The proposed system will detect any objects that will come in its way and also specify the distance between the object and our vehicle also a buzzer will go off when any obstacle is detected and the intensity of this buzzer will keep on increasing as the obstacle closes in. This will help the driver in identifying any dangers in the surrounding. The ultrasonic sensor used is having a range of 4 meters i.e. it will detect any objects which are 4 meter away or less. The exact distance of the object from the vehicle will be displayed on the LCD that is given in the system.



1.2 Night vision-

The proposed system has a camera with infrared sensors that will help the driver in having a proper view at night time. This video audio output from the camera will be worked on using matlab. Using matlab software we can enhance the live feed received from the camera. The lane on the road are marked with white strips which we can use as trigger on matlab and use them as a mark so that the vehicle does not leave the lane it is supposed to drive on. We can have other operations done using this software. The system will also have a dedicated light detection sensor that will indicate if the natural light is sufficient for the driver to go on or not.



Above mentioned are the two basic function the proposed system will work for. Fog detection can be another good addition to the system and so can be some other weather detection sensors. This system will come handy to all sort of users regardless of their location. Although it will be more beneficial to the users who live in areas with extreme weather and for those who have poor vision.

2. Conclusion

During the course of this particular system development we have managed to make a system that is useful in helping the driver see better and eventually adding to the safety of the personnel in the vehicle. Using this system many accidents could be avoided and such an important issue like road safety is taken into consideration. This project is been done using a microcontroller which works as the brain of this system and sensors that provides the system with necessary data from the surrounding. Once the required data is provided to the microcontroller the microcontroller checks those values with some predetermined values or threshold values and if the values from the sensors exceed them a buzzer will go off indicating the driver that something is not right. And if the conditions are bad enough than a display is provided with the system which will show an enhanced version of the live video feed that the camera will provide to the system. This camera will have an infrared sensor which will help the driver see better at night also the lane strips will be indicated with the distance of the vehicle from them and if the driver by mistake goes off his lane than he will be made aware of that. Although this system helps the driver it is very important for the driver to have proper awareness and drive safe.

3. Acknowledgment

The author of this paper would like to thank Prof. Alaam sir for his support and would also like to thank Sanjay Ghodawat institute for the opportunity presented before us.

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