

# Road Traffic Sign Recognition and Vehicle Accident Avoidance System

Snehal Lahare<sup>1</sup>, Ankit Mishra<sup>1</sup>, Ashish Nair<sup>1</sup>, Prof. Nutan Borkar<sup>2</sup>

<sup>1</sup>UG Scholar, Department of Computer Engineering, DYPSOET, Pune, Maharashtra, India

<sup>2</sup>Department of Computer Engineering, DYPSOET, Pune, Maharashtra, India

## ABSTRACT

Traffic sign recognition and vehicle accident avoidance system gets a lot of interest lately by huge scale organizations, e.g., Apple, Google and Volkswagen and so on driven by the market requirements for smart applications, e.g. Automatic Driving and Driver Assistance Systems, Mobile Eye, Mobile Mapping and many more. In this paper, traffic sign recognition and vehicle accident avoidance system is utilized to keep up traffic and maintain a strategic distance from vehicle, caution the occupied drivers, and avoid activities that can lead a vehicle. An on-going programmed sign recognition and detection can support the driver with safety. System propose automated real time system which will capture the traffic sign and show it at driver dashboard with front obstacle exact distance on screen. The PiCam is associated with Raspberry Pi and it is utilized to capture pictures. Screen is utilized to show the system output e.g. appearing of traffic sign and separation of vehicle. This framework is configuration to maintain a strategic distance from vehicle happening on street.

Keywords : PiCAM, Raspberry Pi, Ultrasonic sensors, Traffic Sign recognition.

## I. INTRODUCTION

As indicated by the world vehicle street accident report, India has the top most country for vehicle street accident inside the world. System should make vehicle driver increasingly mindful about breaking distance and traffic signs. In this paper, system propose utilizing raspberry pi and PiCam with ultrasonic sensor, which will alarm driver about traffic signs going ahead street and all the while maintain a strategic distance from front crash utilizing automatic breaking after vehicle enters in breaking distance area.

## II. Problem Statement

Count of street vehicle accident in India are the most noteworthy over the world, thus need to take care of

the problem of traffic vehicle accidents to minimize death ratio. The traffic signs, front and back crash assumes a critical job in the country. In this paper, propose a real time framework which will capture traffic signs and show to driver. System will oversee vehicular breaks as per detecting parameter which will lessen every one of the perils.

## III. Literature Survey

EnisBilgin, et al. [1] portray the qualities of speed signs, necessities and troubles behind executing a constant base framework with inserted framework, and how to manage numbers utilizing picture handling procedures dependent on shape and measurement investigation. The paper additionally demonstrates the methods utilized for arrangement and acknowledgment. Shading examination

additionally assumes an explicitly significant job in numerous other various applications for street sign recognition, this paper focuses to numerous issues with respect to dependability of shading identification because of light conditions, so nonappearance of shading model can drive a superior arrangement. In this task lightweight procedures were principally utilized because of restriction of continuous based application and Raspberry Pi abilities. Raspberry Pi is the principle focus for the usage, as it gives an interface between sensors, database, and picture preparing results, while additionally performing capacities to control fringe units (USB dongle, console and so on.).

Yi Yang, et al. [2] portray traffic sign acknowledgment assumes a significant job in driver partner frameworks and shrewd independent vehicles. Its ongoing presentation is very attractive notwithstanding its acknowledgment execution. This paper means to manage ongoing traffic sign acknowledgment, i.e., restricting what sort of traffic sign shows up in which region of an info picture at a quick handling time. To accomplish this objective, we initially propose a very quick discovery module, which is multiple times quicker than the current best identification module. Our recognition module depends on traffic sign proposition extraction and order based upon a shading likelihood model and a shading HOG. At that point, we collect from a convolution neural system to further group the distinguished signs into their sub classes inside every super class. Trial results on both German and Chinese streets demonstrate that both our recognition and arrangement strategies accomplish similar execution with the cutting edge techniques, with fundamentally improved computational effectiveness.

Priyanka D. et al. [3] depict this work expects to actualize traffic light and sign location utilizing Image preparing method for a self-ruling and vehicle. Traffic Sign Recognition framework is utilized to direct traffic signs, caution a driver and order certain activities. Quick hearty and continuous programmed

traffic sign discovery and acknowledgment can bolster the driver and fundamentally increment driving security. Programmed acknowledgment of traffic signs is likewise significant for a robotized wise driving vehicle or for a driver help framework. This is a visual based venture .

WangCanyong et al. [4] depict the fast improvement of society and economy; cars have turned out to be very nearly one of the advantageous methods of transport for each house-hold. This makes the street traffic condition increasingly convoluted, and individuals hope to have a shrewd Vision-helped application that furnish drivers with traffic sign data, direct driver activities, or aid vehicle control to guarantee street wellbeing. As one of the more significant capacities, traffic sign discovery and acknowledgment.

D. Shahet al. [7] in this paper, we discussed the necessity of automatic animal detection system and our algorithm for animal detection based on HOG and cascade classifier. The algorithm can detect an animal in different conditions on highways. The proposed system achieves an accuracy of almost 82.5 % regarding animal (cow) detection. Estimation of approximate animal distance from the testing vehicle is also done. Though the proposed work has been focused on automatic animal detection in context to Indian highways, it will work in other countries also. The proposed method can easily be extended for detection of other animals too after proper training and testing. The proposed system can be used with other available, efficient pedestrian and vehicle detection systems and can be offered as a complete solution (package) for preventing collisions and loss of human life on highways.

Vishakha Wankhede and Ramesh M. Kagalakar [8] describes that humans use communication, language either by written or spoken to describe the visual world around them so the study of the text description is increasing. This paper represents the framework that gives an output as a description for any long video using natural language processing

Meng-Yin Fu et al. [5] Advanced Driver Assistance Systems (ADAS) refer to various high-tech in-vehicle systems that are designed to increase road traffic safety by helping drivers gain better awareness of the road and its potential hazards as well as other drivers around them. The design of traffic sign recognition, one important subsystem of ADAS, has been a challenge problem for many years and hence become an important and active research topic in the area of intelligent transport systems. The realization of a real-time traffic sign recognition system is usually divided into three stages: detection, tracking and classification. This paper introduces the main difficulties in road sign recognition and briefly surveys the state-of-the-art technologies in this field with further discussions on the potential trend of development.

Amol Jayant Kale et al. [6] explores the effective approach of road sign detection and recognition for Driver Assistance Systems (DAS). In today's world road conditions drastically improved as compared with past decade. Express highways equipped with increased lane size made up with cement concrete. Obviously speed of the vehicle increased. So on driver point of view there might be chances of neglecting mandatory road sign while driving. This paper illustrates proposed system to help driver about the road sign detection to avoid road accidents. The automatic road-signs recognition is an important part of Driver Assisting Systems which helps driver to increase safety and driving comfort. In this paper an efficient approach for the detection and recognition of the road sign in the road and acquiring the traffic scene images.

Pavithra et al. [9] provides an intelligent system for two wheeler accident prevention and detection for human life safety. The prevention part involves, Smart Helmet, which automatically checks whether the person is wearing the helmet and has non-alcoholic breath while driving. The relay does not ON the engine if these two conditions are not satisfied. The microcontroller controls the function of

relay and thus the ignition. The system also enables detection of an accident at any place and reports about the accident to predefined numbers with GSM module. The Microcontroller continuously records all the parameters of automobile for prevention and detection of accident.

D. Shahet al. [10] in this paper, we discussed the necessity of automatic animal detection system and our algorithm for animal detection based on HOG and cascade classifier. The algorithm can detect an animal in different conditions on highways. The proposed system achieves an accuracy of almost 82.5 % regarding animal (cow) detection. Estimation of approximate animal distance from the testing vehicle is also done. Though the proposed work has been focused on automatic animal detection in context to Indian highways, it will work in other countries also. The proposed method can easily be extended for detection of other animals too after proper training and testing.

#### IV. Propose system

A real time sign identification and recognition can support to the driver, essentially expanding driver safety. Traffic sign recognition is utilized to distinguish traffic signs, alert the occupied drivers, and forestall driver activities that can lead an accident.

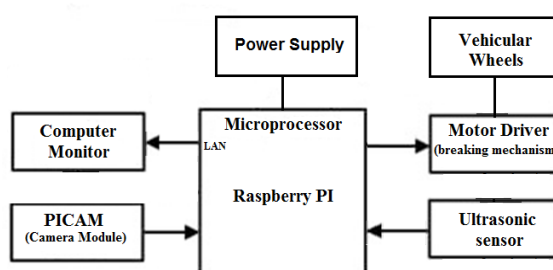


Fig 1: Block Diagram

Let us consider system have two ultrasonic sensors where one is put in the front and another behind the

vehicle. With the help of this sensor, we can figure the distance of the different vehicles nearing us. Therefore, system can find different vehicles and system can driver from accidents. The vehicle accidents avoidance frameworks avoid the street accidents that will typically happening on expressways and in city traffic. These accidents are for the most part occurred by diversion, obviousness, and separation obscure between our vehicles.

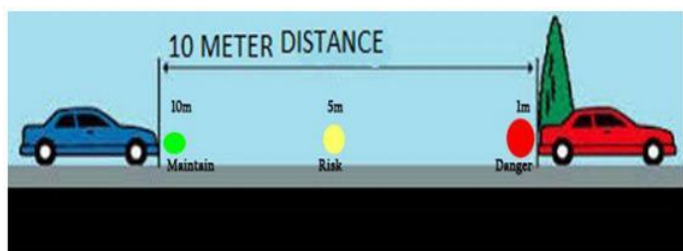


Fig 2: Accident Avoidance System

### V. Methodology

To play out the examination for picture highlights extracts utilizing following steps:

Step 1: Capture input pictures utilizing pi camera and crop the region of sign board.

Step 2: Extract parameters like arrows by edge division (Morphological activities, remove noise).

Step 3: Calculate geometrical properties (Area and border) and figure the roundness esteem.

Step 4: Calculate entropy esteems.

Step 5: Classification algorithm to recognize Traffic Signs.

### VI. Applications

- Accurate crash location detection distance is determined and alarm can be generated for driver.
- This system used for traffic sign recognition progressively.
- It will be using in driverless vehicle system.

### VII. Advantages

- System can distinguish a real-time moving traffic signs.
- Low cost arrangement.
- It will decrease the death count because of driver carelessness.
- It can without much of a stretch be implanted in vehicle controller hardware.
- It will stay away from back or head-on impact.
- It will spread mindfulness about driving discipline and traffic signs.
- Real-time and effective supervision can help driver to careful all time in driving.

### VIII. RESULT

In propose model system worked on different sign shown in following figure. The traffic sign detection is done using Raspberry pi and Python.

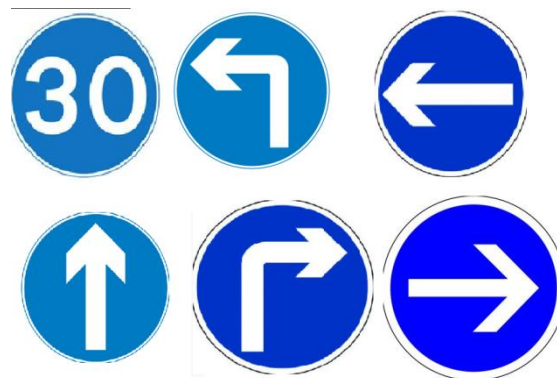


Fig 3: Traffic sign

The following figure shows the traffic sign detected output. Using this detected sign system has controlled a robot for now.

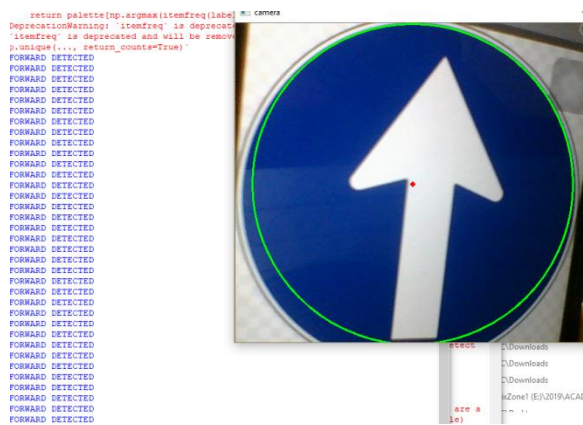


Fig 4: Traffic sign detected output

This is proposing prototype model for traffic sign detection and vehicle accident avoidance system model. The prototype contains Raspberry pi, pi camera, ultrasonic sensor and robot chassis.



Fig 5: Propose system prototype model

## IX.CONCLUSION

In this paper, proposed framework, PICAM is recognizing the traffic sign on street and alert to the driver. On the off chance that the driver has disregarded the traffic sign, at that point automatic braking system will be actuated by Raspberry Pi microcontroller. Then again, framework will consistently track front vehicle distance utilizing ultrasonic sensor, and breaks will be connected by distance. This will keep away from the vehicle accidents because of sign board carelessness, likewise this will drivers to keep up safe distance between the vehicles. This will likewise maintain a strategic

distance from the accidents happening because of head-on impact. The alarm on dashboard will make driver constantly mindful of the street status.

## IX. Future Scope

This framework can be utilized progressively vehicles for greater security reason to maintain a strategic distance from loads of accidents happening on streets. Framework can likewise be teamed up with driverless vehicle application to improve its precision. This framework can be coordinated in the vehicles and lorry vehicles with low spending plan to make driving framework increasingly powerful.

## X. REFERENCES

- [1]. EnisBilgin, Dr. Stefan Robila, "Road Sign Recognition System on Raspberry Pi", IEEE, 2016.
- [2]. Yi Yang, HengliangLuo, HuarongXu, and Fuchao Wu, "Towards Real-Time Traffic Sign Detection and Classification", IEEE, Transactions on Intel Ligent Transportation Systems, 2016.
- [3]. Priyanka D, Dharani K, Anirudh C, Akshay K, Sunil M P, Hariprasad S A, "Traffic Light and Sign Detection for Autonomous Land Vehicle Using Raspberry Pi", Proceedings of the International Conference on Inventive Computing and Informatics (ICICI 2017), IEEE Xplore Compliant - Part Number: CFP17L34-ART, ISBN: 978-1-5386-4031-9.
- [4]. Wang Canyon, "Research and Application of Traffic Sign Detection and Recognition based on Deep Learning", IEEE Conferences, International Conference on Robots & Intelligent System (ICRIS), 2018..
- [5]. Amol Jayant Kale, Prof. R.C.Mahajan, "A Road Sign Detection and the Recognition for Driver Assistance Systems", 2015 International

- Conference on Energy Systems and Applications (ICESA 2015).
- [6]. P. Pavithra, T. Preethi, "Intelligent Transportation System for Accident Prevention and Detection", International Conference on Intelligent Computing and Control Systems ICICCS 2017.
- [7]. Vishakha Wankhede, Ramesh M. Kagalkar, "Support Vector Machine based Approach for the Text Description from the Video", International Journal on Computational Vision and Robotics (IJCVR), Vol. 8, No. 4, 2018
- [8]. Meng-Yin Fu, Yuan-Shui Huang, "A Survey of Traffic Sign Recognition", Proceedings of the 2010 International Conference on Wavelet Analysis and Pattern Recognition, Qingdao, 11-14 July 2010.
- [9]. Saurav Agrawal, Dr. Mrs. S.W.Varade, "Collision Detection and Avoidance System For Vehicle", Proceedings of the 2nd International Conference on Communication and Electronics Systems (ICCES 2017) IEEE Xplore Compliant - Part Number: CFP17AWO-ART
- [10]. D. Shah, "A Practical Animal Detection and Collision Avoidance System Using Computer Vision Technique", IEEE 2016

**Cite this article as :**

Snehal Lahare, Ankit Mishra, Ashish Nair, Prof. Nutan Borkar, "Road Traffic Sign Recognition and Vehicle Accident Avoidance System", International Journal of Scientific Research in Computer Science, Engineering and Information Technology (IJSRCSEIT), ISSN : 2456-3307, Volume 6, Issue 3, pp.484-489, May-June-2020. Available at doi : <https://doi.org/10.32628/CSEIT2063123>  
Journal URL : <http://ijsrcseit.com/CSEIT2063123>