IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9518

Autonomous Car

Shubham Arya[1], Vishal Kumar Singh[2], Dr. Vinay Saini[3]

Scholars, Maharaja Agrasen Institute of Technology (IT)[1,2]

Associate Professor, Maharaja Agrasen Institute of Technology (IT)[3]

Abstract: Automatic detection, detection of traffic, Lane and traffic are important and may be used to help drivers reduce errors and ultimately in self driving vehicles. In this paper, the CNN model is used to create an Autonomous Traffic sign, lane and traffic recognition system. The proposed framework works continuously to distinguish and visualise traffic signals, identify lanes by hauge transform and differentiation between vehicles using canny. The commitment of this paper is in addition to the newly acquired knowledge of 43 different road signs collected on the sides of unusual locations, lanes, cars and various trucks in India. Images are taken at various points and include various parameters and conditions. A total of 40000+ images were collected to include a set of data sets we named Indian Traffic and road signs. In cars and traffic we use a CNN model called YOLO. CNN engineering has been used with flexible parameters to achieve the best accuracy results. Test results show that the proposed CNN engineering has 98% accuracy, in this way higher than that achieved in previous comparative studies.

Keywords: Lane cars sign Detection, Convolutional Neural Network, Deep Learning, Open CV, Canny,

INTRODUCTION

Automatic detection has gained importance with advances in image processing due to the benefits that such a system may provide. The new turns of events and interest in self-driving vehicles has likewise expanded the interest in this field. An automated traffic sign recognition, Lane detection, traffic detection will give the capacity to smart cars and smart driving. Indeed, even with a driver in the driver's seat, the model might provide vital information to the driver diminishing human blunders that cause accidents. With such a model coordinated into vehicles, it is expected that the number of car accidents will be reduced greatly saving human lives and the monetary value associated with car accidents. Automated systems will be able to control traffic on both open streets and convergences too.

Since, saving lives and saving cost is the main goal behind creating such a system. Hence, the goal of this work is to program traffic sign identification and recognition systems based on deep learning algorithms. The proposed system has the ability to recognize the signs, lanes, and traffic within images captured by cameras and handled by a Deep CNN . The majority of car accidents are caused by human mistake, such as drivers failing to notice a traffic sign or driving in the opposite way of a traffic sign. As a result, this study emphasises the importance of developing and testing a traffic sign detection system for Traffic Signs, as well as dealing with related concerns. In this automatic recognition system should also classify traffic signs into distinct classes in real-time to avoid recognition errors , Lanes and traffic (cars, trucks, buses) . In this paper, the deep learning for a cnn model , hauge transform , yolo approach , despite the fact that essential traffic signs are restricted at this point joined with street signs, road name signs, and so on the dataset expands with unlimited potential outcomes. The ultimate goal is to have a system fitted into cars that can detect and recognize any traffic sign, lanes , traffic to help the driver or self driving process.

-The rest of the paper is organised as follows:

- section 2, Methodology
- Section 4, Result Analysis.
- Section 5, shows the results along with discussion.
- Section 6, concludes the work and
- section 7, lists all the references used in this work.

METHODOLOGY

To recognize traffic signs, Lanes and traffic we focused on machine learning algorithms. Numerous new research works on traffic signs utilised CNN. For detecting and recognizing traffic signs we build and CNN model on other hand we use

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9518

hauge transform for lane detection and yolo for traffic detection. In the following stage we likewise assessed the proposed approach with CNN, hauge transform and yolo

Data Collection and Preparation

To complete this study a dataset was worked from editing images outline. We gather some Images of traffic signs to assemble a real dataset. Then, we arranged its own classes and split the entire data into various sections in which each section contains the same type of images. We have completed 40000+ pictures to propose the CNN model.

Description	Traffic Sign	Description	Traffic Sign
Turn Left		Danger	
Stop		40km/h	
Only Left		30km/h	
Only Right		Turn Right	
Road Merges Ahead		Pedestrian	
Speed Breaker		Bike	

Convolutional Neural Network

CNN is a part of a deep learning mechanism. CNN model addresses a tremendous process in image recognition. research fields focused on CNN to achieve the highest accurate result . The CNN model we build consist of following layers:

- 2 Conv2D layer (filter=32, kernel_size=(5,5), activation="relu")
- MaxPool2D layer (pool_size=(2,2))
- Dropout layer (rate=0.25)
- 2 Conv2D layer (filter=64, kernel_size=(3,3), activation="relu")
- MaxPool2D layer (pool_size=(2,2))
- Dropout layer (rate=0.25)
- Dropout layer (rate=0.5)
- Dense layer (43 nodes, activation="softmax")

Hauge Transform

In this model to detect Lanes, geometrical understanding or to get the exact location of the image. This ability of the Hough transform to identify edges and corners of the object makes it an ideal tool for detecting lanes for a self-driving car.

Following steps are used in lane detection-

- Grayscale the image: This helps by increasing the contrast of the colours
- Gaussian Filter: reduce noise in the image
- Canny: detect the edges in the image

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9518

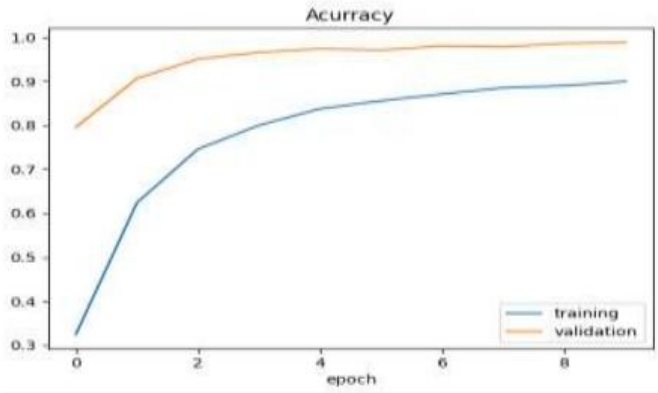
Yolo

It is an AI model that uses Conventional neural networks to process and give real-time object detection. This model is kinda popular because of its speed and accuracy in detection . It is used in this model to detect traffic (cars truck cars).

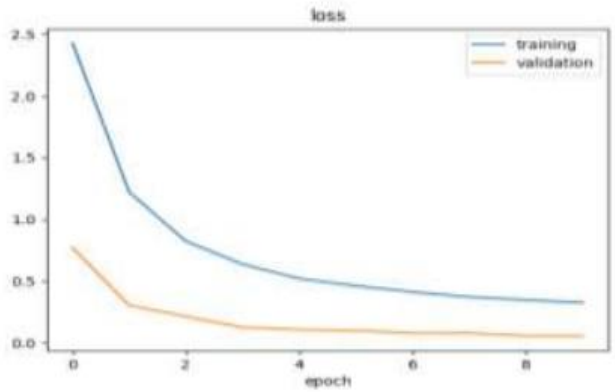
RESULT ANALYSIS

In this section we will check about the result which is output by CNN model. We trained model upto 99.56% training accuracy and 96.40% testing accuracy. The training accuracy, approval accuracy and CNN model is visualised in given graph

Accuracy:-



Loss:-



IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9518

After this model is trained and ready to run we can see traffic sign Lane and cars are detecting by the model

The purpose of this paper was to offer a successful vehicle, lane and traffic sign detection, recognition system. In this project CNN model, hauge tranform and yolo are used to reduce significant traffic congestion.

REFERENCES

● Traffic Sign Recognition System TSRS and Convolutional Neural Network
● Real-time traffic sign recognition system

IARJSET ISSN (O) 2393-8021, ISSN (P) 2394-1588

International Advanced Research Journal in Science, Engineering and Technology

Impact Factor 7.105 ⁜ Vol. 9, Issue 5, May 2022

DOI: 10.17148/IARJSET.2022.9518

● Zsolt T. Karl Kovacs, Zsombor Par´oczi, Endre Varga U1 Research Ltd. 2 Gabor Dene str. ´ INFOPARK, Budapest, Hungary H-1117

● Assistant Professor,2,3,4 UG Scholar Department of Electronics and Communication Engineering Kongunadu College of Engineering and Technology (Autonomous Thottiyam, Trichy, Tamilnadu, India)

● Udemy

● Youtube/codebasics

● UCI

