International Journal of Scientific Research in Engineering and Management (IJSREM)
Volume: 07 Issue: 05 | May - 2023 Impact Factor: 8.176 ISSN: 2582-3930

# Traffic Sign Classification for Automated Cars

[1] **Ms. Pallavi Shejwal**, Assistant Professor, Information Technology Engineering Department,
Progressive Education Society's Modern College of Engineering, Pune - 411 005 (Maharashtra)(India)

[2]Student VIII Semester B.E(Information Technology),
**Aditya Korad[1], Kartikeya Bapat[2], Harshal Kamble[3], Chaitanya Virkar[4]**

Progressive Education Society's Modern College of Engineering, Pune - 411 005 (Maharashtra)(India)

---

**Abstract -** Developing an automated driver guidance system is very important in the context of Indian road conditions. Be it a human driver driving a car or a self-driven car, following traffic signs on Indian roads is necessary. A lot of traffic sign violations are seen and heard of, mainly the reasons for which are over speeding, broken traffic signs, distorted signs, night time conditions, etc. In India there are multiple roads where traffic signs do not survive and are mostly broken are covered in trees or any hindrance. Traffic signs are mostly damaged and distorted by the civilians itself which causes more traffic sign violations.

The recent technical development in mobile processors led many automobile manufacturers to deploy computer vision systems into their cars. These systems ensure safety which is a crucial aspect for autonomous vehicles. Traffic sign recognition is one of the most well-known and widely discussed tasks that can be solved by these computer vision systems. It can ensure safety as it allows the vehicle to know what different signs on the road mean and act accordingly. However, such systems come with problems like low accuracy in detection, and some systems are unable to detect traffic signs from different countries.

***Key Words*: *Python Imaging Library (PIL), Deep Learning, Neural Networks.***

## 1.INTRODUCTION

Traffic symbols are the hushed presides on the road. Survive it a person steering the ship or a bystander, having noise data concerning road refuge is basic for each and every one prior to striking the streets. Traffic signs give data about the street conditions ahead, give guidelines to be followed by the significant meeting point or intersection, warning or lead drivers, and warranty for suitable functioning of avenue travel. Creature unconscious of lane symbols is similar to leaving in front even though one probable risk. It preserves prompt loss tax and material goods. An individual should be identifiable (traverse an unruffled or oral test) with the traffic symbols and metaphors prior to securing a lashing authorize in India. Traffic sign characterization is a cycle of unsurprisingly deceiving traffic symbols beside the lane, as well as rapidity boundary symbols, carefulness symbols, consolidate symbols, and so into view. Having the option to naturally perceive traffic symbols accredit us0 to manufacture "more brilliant vehicles". Self-driving vehicles need traffic sign acknowledgment so as to appropriately parse and comprehend the street. Essentially, "driver alert" frameworks inside vehicles need to comprehend the street around them to help and ensure drivers. Traffic sign acknowledgment is only one of the issues that PC vision and profound learning can understand. The traffic signs are situated as an afterthought or head of the street. They give headings on how ought to carry on out and about, so the traffic can continue securely and easily. Everybody must realize the traffic signs! Street Safety symbols consist of 3 Types:

1. Required symbols: 40 traffic symbols are wield to pledge at no cost enlargement of traffic and build the lane patrons aware of explicit acts and guidelines, limitations, forbiddances. Contravention of these street security symbols are a crime, consisting to regulation.

2. Anticipatory symbols: These 35 traffic symbols formulate the lane patron's conscious of risky situation away from home and concerning heretofore. The operators, appropriately, obtain important tricks to compact among the situation.

3. profitable symbols: These 13 traffic symbols deal among lane patrons regarding objections, separation, optional procedures, and perceptible places similar to food connections, public latrines, near via clinics, etc

### 1.1 Classification

In this system, a CNN model was built with different dimensional filters like 3 × 3, 5 × 5, 9 × 9, 13 × 13, 15 × 15,19 × 19, 23 × 23, 25 × 25 and 31 ×31. Based on that, the model with the best accuracy was further used in the detection model. In order to classify traffic sign's we used the GTSRB dataset which consists of 50000 images of traffic signs which are basically divided into 43 different classes. This dataset was split into training and validation sets. The Indian Dataset is used as well in the test sets for building the model using Transfer Learning.

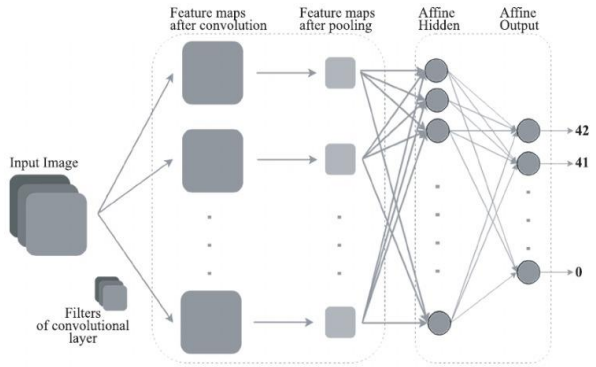


**Fig-1 : Working of CNN**

All the images and their labels were stored into lists (data and labels). The list was then converted into numpy arrays for feeding to the model. The shape of data is (86989) which means that there are 86,989 images of size 32×32 pixels and the last 3 means the data contains colored images (RGB value). While importing images total classes related to that image is detected and every image has its own corresponding id which is stored in class number. Data related to images was stored in xtrain , xtest , xvalidation and corresponding id in each class is stored in ytrain , ytest , yvalidation. The CNN model has one convolutional layer with 32 filters, ReLU (Rectified Linear Unit) activation function, one downsampling layer with 2 × 2 maximum factor, and hidden affine layer with 500 neurons that is followed by the output layer with 43 neurons as number of classes.

## 2 Formality Datasets-

1. The most common dataset used for the purpose is GTSRB which consists of 43 classes. In the proposed system, a prediction model is trained using this dataset. It performs best for image classification. Lately, Convolutional Neural Network has been adopted in object recognition for its high accuracy and less computational cost.

2. The German traffic signs detection dataset is provided here . The dataset consists of 39209 images with 43 different classes. The images are distributed unevenly between those classes and hence the model may predict some classes more accurately than other classes.

## 2. LITERATURE SURVEY

These days, the main objective in video surveillance applications is object recognition from a video In order to locate necessary objects in video sequences and group their pixels together, object detection technology is performed In many applications, especially those used for video surveillance, the detection of an item in a video sequence is crucial Processes including pre- processing, segmentation, foreground and background extraction, and feature extraction can be used to recognize objects in a video stream. Humans are able to quickly recognize and locate things in an image. With minimal conscious effort, the human visual system can complete complicated tasks like recognizing several objects. It is quick and accurate We can now readily train machines using vast amounts of data, faster GPUs, and improved algorithm

## 3. METHODOLOGY

When you go on the road, you see various traffic signs like traffic signals, turn left or right, speed limits, no passing of heavy vehicles, no entry, children crossing, etc., that you need to follow for a safe drive. Likewise, autonomous vehicles also have to interpret these signs and make

decisions to achieve accuracy. The methodology of recognizing which class a traffic sign belongs to is called Traffic signs classification.

In this Deep Learning project, we will build a model for the classification of traffic signs available in the image into many categories using a convolutional neural network (CNN) and Keras library

**Methodology:** We need to follow the below 4 steps to build our traffic sign classification model:

- Dataset exploration
- CNN model building
- Model training and validation
- Model testing

## 4. PREPARING AND TRAINING DATASET

We have collected and added all the different types of animals in the database for training the system. Following is the proposed procedure for training and testing of the data for traffic sign detection:

- Collect all the images of traffic signs in data folder
- These images are labelled by using labelling software
- Converting the Dataset images into train, test, and validate and TensorFlow record.
- Training dataset with Sequential model on the TensorFlow and detect the object for the Input image.


**Fig-2: Image Dataset**

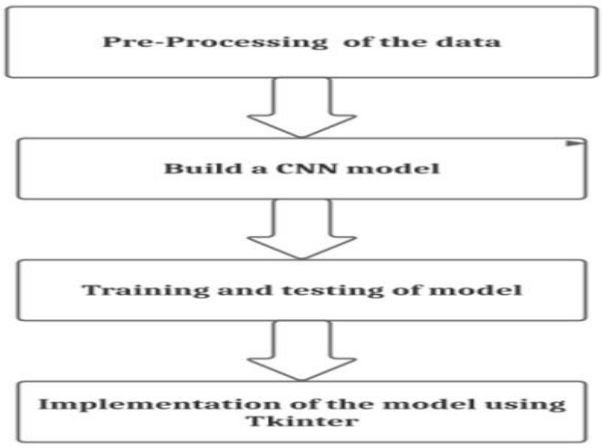


**Fig-3 : Flow of the Model**

.

An efficient automatic traffic sign detection and a warning system can help drivers in reducing the number of collisions occurring between the animal and the vehicle on roads and highways. In this paper, we discussed the necessity of automatic animal detection system and our algorithm for traffic sign detection based on. The algorithm can detect traffic signs in different conditions on roads. The proposed system achieves an accuracy of almost 95% regarding traffic sign detection.

## 5. RESULT

```
[56] # Now the results display shall begin:
     img = Image.open(test_path + '/00130.png')
     img
```

```
#Print the label automatically on its own:
print("Original Label : ",all_labels[y_test[130]])

Original Label :  Go straight or right
```

**Fig-4: Result 1**

```
[33] # Now the results display shall begin:
     img = Image.open(test_path + '/00181.png')
     img
```

```
[35] #Print the label automatically on its own:
     print("Original Label : ",all_labels[y_test[181]])

     Original Label :  Speed limit (70km/h)
```

**Fig-5: Result 2**

```
[43] # Now the results display shall begin:
     img = Image.open(test_path + '/00199.png')
     img
```

```
#Print the label automatically on its own:
print("Original Label : ",all_labels[y_test[199]])

Original Label :  Children crossing
```

**Fig-6: Result 3**

## 7. CONCLUSIONS

In this project, we introduced a new method for recognition and tracking of traffic signs dedicated for an automatic traffic assistance system. The proposed system is based on intersection of traffic sign on a known grid pattern. It is simple and easy to implement with low computational complexity. The proposed system was able to achieve more than 95% accuracy and able to detect traffic sign between 30 to 40 milliseconds. In future, we can achieve more accuracy by adding more no of images or by increasing the size of the database. We can have more classes

## REFERENCES

[1] Nikonorov, Artem, P. Yakimov, and P. Maksimov. "Traffic sign detection on GPU using color shape regular expressions." VISIGRAPP IMTA-4 2013 (2013).

[2] Belaroussi, Rachid, et al. "Road sign detection in images: A case study." 2010 20th International Conference on Pattern Recognition. IEEE, 2010.

[3] Ruta, Andrzej, et al. "A new approach for in-vehicle camera traffic sign detection and recognition." (2009).

[4] Fursov, Vladimir Alekseevich, Sergey Alexeevich Bibikov, and Pavel Yurievich Yakimov. "Localization ofobjects contours with different scales in images using Hough transform." Computer optics 37.4 (2013): 496-502

[5] Koraqi Tetovo University, Florim Idrizi(2020) Detection, identification and tracking of objects during the motion" International conference for object detection for blinds