



## TRAFFIC SIGN RECOGNITION USING DEEP LEARNING

<sup>1,2,3,4</sup> Raavi Kavya Sri, Saritha Danu, Rayudu Sai Sheshu, Jillela Sathvik Reddy,  
<sup>5</sup>K. Krishna

<sup>1,2,3,4</sup> Ug scholars, MallaReddy college Of Engineering , Hyderabad - 500100

<sup>5</sup> Assistant Professor, MallaReddy college Of Engineering , Hyderabad – 500100

### ABSTRACT

To ensure a smooth and secure flow of traffic, road signs are essential. A major cause of road accidents is negligence in viewing the Traffic signboards and interpreting them incorrectly. The proposed system helps in recognizing the Traffic sign and sending a voice alert through the speaker to the driver so that he/ she may take necessary decisions. The proposed system is trained using Convolutional Neural Network (CNN) which helps in traffic sign image recognition and classification. A set of classes are defined and trained on a particular dataset to make it more accurate.

### 1.1 INTRODUCTION

Human factor remains the most common cause of road mortality. Indeed, the potentially dangerous choices made by the driver might be intentional (speed driving, for example) as they might be the result of physical tiredness, drowsiness or a poor perception and interpretation of

seen scenes. The introduction of autonomous vehicles will certainly reduce these causes or even make them disappear.

### LITERATURE SURVEY

#### 2.1 LITERATURE SURVEY

Sign board recognition and driver alert system which has a number of important application areas that include advance driver assistance systems, road surveying and autonomous vehicles. This system uses image processing technique to isolate relevant data which is captured from the real time streaming video. The proposed method is broadly divided in five part data collection, data processing, data classification, training and testing. System uses variety of image processing techniques to enhance the image quality and to remove non-informational pixel, and detecting edges. Feature extractor are used to find the features of image.

**TITLE : Automatic Signboard Detection System by the Vehicles.**

**AUTHOR : Anushree. A, S. Kumar, H. Iram, & Divyam. K.**

**YEAR 2019**



## DESCRIPTION

A major cause of accidents is not considering the signboards on roads, and not following the rules accordingly.

## SYSTEM ANALYSIS

### 3.1 EXISTING SYSTEM

- Burgoon et al. used 16 linguistic features categorized in four classes, which achieved an accuracy of 60.72% using a DT algorithm with 15-fold cross-validation.
- Vicario et al. used different features like text (e.g., number of characters, words, sentences, question marks, and negations), user-specific, and message specific (e.g., number of replies, likes) to identify hoaxes and fake news on social media using linear regression, logistic regression, support vector machine (SVM), K-nearest neighbor (KNN), and NNs.

### 3.2 DRAWBACKS

- The fast scattering of data at a high rate with minimal effort enables the widespread of false information, such as fake news, which are harmful to society and people.

### 3.3 PROPOSED SYSTEM

- In our proposed system, we develop the Traffic Sign Board Recognition and Voice Alert System using Convolutional Neural Network. Our system will be able to detect, recognize and infer the road traffic signs would be a prodigious help to the driver.

### 3.4 ADVANTAGES

- The accuracy of the proposed system is 97% and this model turned out to give the best accuracy as compared to the other models that we analysed in the existing.

### 3.5 SYSTEM REQUIREMENTS



## HARDWARE

PROCESSOR : DUAL CORE 2 DUOS.  
 RAM : 4GB DD RAM  
 HARD DISK : 250 GB

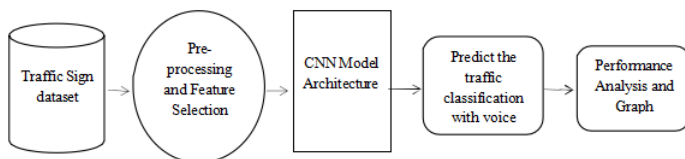
## SOFTWARE

- OPERATING SYSTEM
- PLATFORM
- PROGRAMMING LANGUAGE
- FRONT END

## CHAPTER-4

### SYSTEMDESIGN

#### 4.1 SYSTEM ARCHITECTURE



#### 4.2 MODULES

##### Modules Names

- 1 Dataset
- 2 Importing the necessary libraries
- 3 Retrieving the images
- 4 Splitting the dataset

## MODULES DESCRIPTION

### 1. Dataset

In the first module, we developed the system to get the input dataset for the training and testing purpose. We have taken the dataset from German Traffic Sign Benchmark single-image classification challenge. We used the International Joint Conference on Neural Networks.

: PYTHON, HTML

### 2. Importing the necessary libraries

We will be using Python language for this. First we will import the necessary libraries such as keras for building the main model, sklearn for splitting the training and test data, PIL for converting the images into array of numbers and other libraries such as pandas, numpy, matplotlib and tensorflow.

### 4.3 UML DIAGRAMS

#### 4.3.1 DATA FLOW DIAGRAM

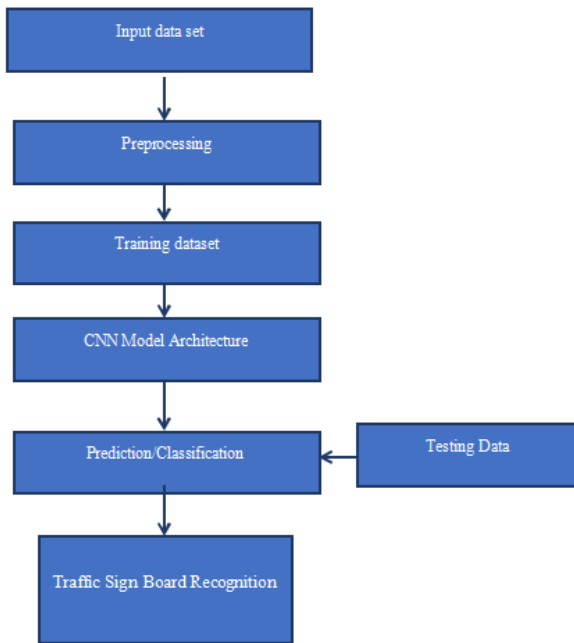


Fig: 4.3.1 Data Flow Diagram

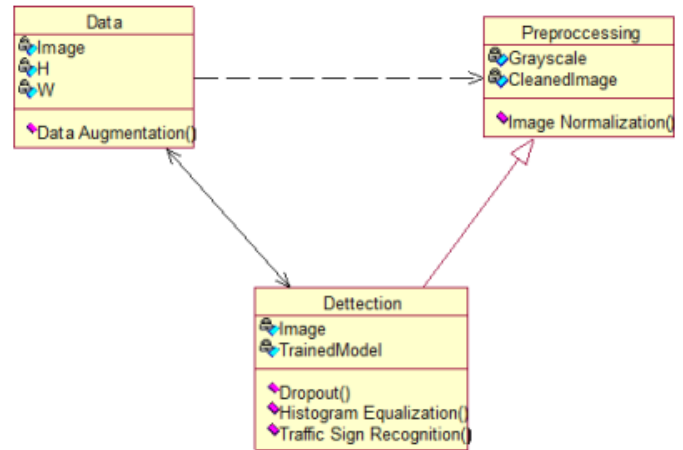


Fig: 4.3.3 Class Diagram

## 4.3.2 USE CASE DIAGRAM

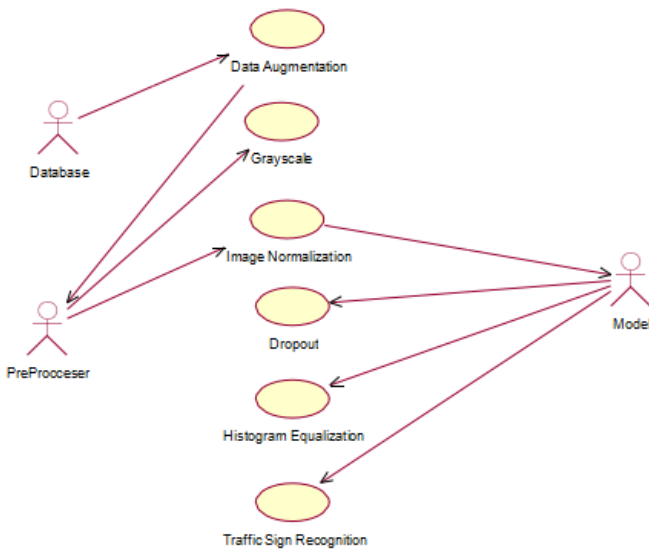


Fig: 4.3.2 Use Case Diagram

## 4.3.3 CLASS DIAGRAM

## CHAPTER-5

### SYSTEM IMPLEMENTATION

#### 5.1 DEEP LEARNING

Deep learning allows computational models that are composed of multiple processing layers to learn representations of data with multiple levels of abstraction. These methods have dramatically improved the state-of-the-art in speech recognition, visual object recognition, object detection and many other domains such as drug discovery and genomics.

#### 5.2 PYTHON

Python programming language is used for building the machine learning model.

#### Introduction



Python is an object-oriented, high level language, interpreted, dynamic and multipurpose programming language.

## 5.3 PYTHON FEATURES

### 1) Easy to Use

Python is easy to very easy to use and high-level language. Thus it is a programmer-friendly language.

## 5.4 PYTHON APPLICATIONS

□ Python as a whole can be used in any sphere of development. Let us see what are the major regions where Python proves to be handy.

### 1) Console Based Application

Python can be used to develop console based applications. Audio or Video based Applications Python proves handy in multimedia section.

## 5.5 FUNDAMENTALS OF PYTHON

This section contains the basic fundamentals of Python.

### Tokens

Tokens can be defined as a punctuator mark, reserved words and each individual word in a statement. Token is the smallest unit inside the given program. Tokens include Keywords,

Identifiers, Literals, Operators.

### Tuples

Tuple is another form of collection where different type of data can be stored. It is similar to list where data is separated by commas.

## 5.6 PACKAGES

### Pandas

- Pandas is a powerful library for data manipulation and analysis in Python.
- It provides data structures and functions to efficiently handle and process structured data.

Pandas is widely used for tasks such as data cleaning, data exploration, data transformation, and data aggregation.

## TESTING

### 1.1 INTRODUCTION

The purpose of testing is to discover errors. Testing is the process of trying to discover every conceivable fault or weakness in a work product. It provides a way to check the functionality of components, sub-assemblies, assemblies and/or a finished



product It is the process of exercising software with the intent of ensuring that the Software system meets its requirements and user expectations and does not fail in an unacceptable manner.

## 1.2 DEVELOPING METHODOLOGIES

The test process is initiated by developing a comprehensive plan to test the general functionality and special features on a variety of platform combinations. Strict quality control procedures are used. The process verifies that the application meets the requirements specified in the system requirements document and is bug free. The following are the considerations used to develop the framework from developing the testing methodologies.

## RESULTS

### 7.1 SCREEN SHOTS

7.1.1 Homepage



Fig 7.1.1: Home Page

7.1.2 User Login Page

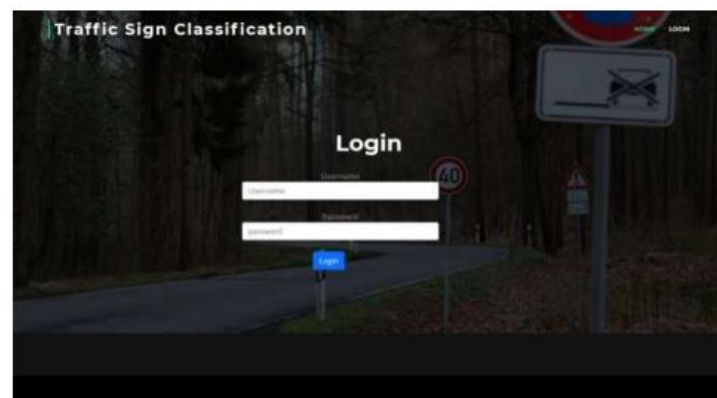


Fig 7.1.2: User Login Page

7.1.3 Verifying user



Fig 7.1.3: Verifying user

## 7.1.4 Image upload



Fig 7.1.4: Image upload

## CHAPTER-8 CONCLUSION

### 8.1 CONCLUSION

The Traffic Sign Board Detection and Voice Alert System is implemented using Convolutional Neural Network. Various models under the CNN heading were studied and the one with highest accuracy on the GTSRB dataset was implemented. The creation of different classes for each Traffic sign has helped in increasing the accuracy of the model. A voice message is sent after recognition of the sign which alerts the driver, thus helping him/her take appropriate decisions.

## CHAPTER-9 FUTURE

### ENHANCEMENT

#### 9.1 FUTURE ENHANCEMENT

The prototype can be expanded to include an inbuilt alert system with a camera in the vehicle's centre. Also, the feature of

getting the estimated time for reaching that particular traffic sign can be added.

## CHAPTER-10 REFERENCES

### 10.1 REFERENCES

- [1] Anushree.A, S. Kumar, H. Iram, I.Divyam, (2019). Automatic Signboard Detection System by the Vehicles.
- [2] M A Muchtar et al 2017 J. Phys.: Conf. Ser. 801 012010.
- [3] Systems (IFSA-SCIS), Otsu, Japan, 2017, pp. 1-6, doi: 10.1109/IFSA-SCIS.2017.8023239.
- [4] Bi, Z., Yu, L., Gao, H. et al. Improved VGG model-based efficient traffic sign recognition for safe driving in 5G scenarios.
- [5] Han, C., Gao, G. & Zhang, Y. Real-time small traffic sign detection with revised faster-RCNN. Multimed Tools Appl 78, 13263–13278 (2019). <https://doi.org/10.1007/s11042-018-6428-0>