**DETECTION AND CLASSIFICATION OF TRAFFIC SIGN BASED ON SHAPE BASED FEATURES**

**INTRODUCTION**

Traffic Sign Recognition is a technology by which a vehicle is able to recognize the traffic signs put on the road e.g. "speed limit" or "children" or "turn ahead". This is part of the features collectively called ADAS.

**ABSTRACT**

Traffic sign detection is a topic in [computer science](https://en.wikipedia.org/wiki/Computer_science) and [language technology](https://en.wikipedia.org/wiki/Language_technology) with the goal of interpreting traffic signs via mathematical [algorithms](https://en.wikipedia.org/wiki/Algorithm). Traffic sign recognition has high industrial potential in Driver Assistant System and Intelligent Autonomous Vehicles. There are two tasks in a typical traffic sign recognition system: finding the locations and sizes of traffic signs in natural scene images (traffic sign detection) and classifying the detected traffic signs into their specific sub-classes (traffic sign classification). This paper aims to deal with traffic sign recognition, i.e., localizing what type of traffic sign appears in which area of an input image at a fast processing time. To achieve this goal, we first propose an extremely fast detection module. Our detection module is based on traffic sign proposal extraction and classification built upon a HOG. Then we use mean subtraction algorithm to eliminate the background and to segment the foreground. Based on thresholding the mean subtracted greyscale image is converted to binarized image in which the shape of the traffic sign is completely visible. We use shape feature extraction algorithm to extract the shape features of image. Then, we use SVM algorithm to classify and recognize the different traffic signs.

**PROBLEM STATEMENT**

There are two tasks in typical traffic sign recognition system: finding the locations and sizes of traffic signs in natural scene images (traffic sign detection) and classifying the detected traffic signs into their specific sub-classes (traffic sign classification). Traffic signs are designed with regular shapes and conspicuous colors to attract human drivers’ attention so as to be easily captured by human drivers. However, there are many difficulties for identifying traffic signs by computer algorithms due to illumination changes, color deterioration, motion blur, cluttered background and partial occlusion, etc.

**OBJECTIVE OF THE PROJECT**

The objective of the proposed system is to design an approach which automatically detects the traffic sign and classifies the traffic sign such as U-Turn, Right-Turn, Left-Turn, Danger and Speed-Limit, etc.

**MOTIVATION**

The motivation of our work is to design an approach which automatically detects the traffic sign and classifies the traffic sign as U-Turn, Right-Turn, Left-Turn, Danger and Speed-Limit, etc., The goal of traffic sign detection is to identify the region of interest (ROI) in which a traffic sign is supposed to be found and verify the sign after a large-scale search for candidates within an image

**EXISTING SYSTEM**

The first work on automated traffic sign detection was reported in Japan. This attempt was followed by several methods introduced by different researchers to develop an efficient TSDR system and minimize all the issues stated above.

**DISADVANTAGES OF EXISTING SYSTEM**

* Low accuracy in detecting the traffic sign
* Mismatch occurs.
* Not proper segmentation of foreground regions (traffic-sign)
* Image quality is low.

**PROPOSED SYSTEM/METHODOLOGY**

In this paper, we present a real-time traffic sign recognition system consisting of detection and classification modules. In this paper, we present an automatic traffic sign recognition system by using different traffic sign images. We present an approach for identifying and recognizing different traffic sign. The proposed approach presents a very low degree of complexity, which makes it suitable for real-time applications. At first, the different traffic sign images captured from the camera are given as the input. The RGB image is converted into grayscale form. The shape of the image is detected using Histogram of Gradient (HOG) features.

The image is enhanced using Contrast Limited Adaptive Histogram Equalization (CLAHE) algorithm. The Features such as mean and standard deviation are extracted for the color images using color moments. The background portion of the images is eliminated and only the ROI part is extracted using thresholding. i.e., we need to convert the image into binary image based on thresholding. Threshold level is computed using Otsu global thresholding. The unwanted objects other than the ROI part is removed using connected components removal under morphological operations. Then the shape features such as Area, Major Axis Length and Minor Axis Length and texture features such as Entropy is measured for the binarized image. Depending upon the selected features and the measured region properties in the given image, the different traffic sign images are classified. We finally use Multi-SVM algorithm for classification. Finally the traffic sign expressions can be classified as U-Turn, Right-Turn, Left-Turn, Danger and Speed-Limit.

**PROPOSED TECHNIQUE**

* Contrast Limited Adaptive Histogram Equalization (CLAHE)
* Canny Edge Detector
* Thresholding (Binarization)
* Morphological Operations
* Shape and Region based Feature Extraction
* MultiSVM

**PROPOSED SYSTEM ADVANTAGES**

* It automatically identifies the traffic sign expression of the human correctly
* It results in high accuracy
* This yields a better result in terms of the recognition accuracy compared to that of the former methods
* Computational complexity is low.
* The proposed method is superior compared with other state-of-the-art approaches and that the analysis of the general image quality of the input images reveals highly valuable information

**PROPOSED SYSTEM BLOCK DIAGRAM**

**TRAFFIC SIGN IMAGES**

**TRAFFIC SIGN DETECTION (HOG)**

**RGB TO GRAY CONVERSION**

**PREPROCESSING (ENHANCEMENT)**

**REGION PROPERTIES MEASUREMENT**

**SHAPE BASED FEATURE EXTRACTION**

**TRAINED FEATURES**

**RECOGNIZED TRAFFIC SIGN AS OUTPUT**

**SVM CLASSIFICATION**

**DETECTED FEATURES**

**TESTING INPUT IMAGE**

**APPLICATIONS OF TRAFFIC SIGN RECOGNITION**

Traffic sign recognition has high industrial potential in Driver Assistant System and Intelligent Autonomous Vehicles.

**SOFTWARE REQUIREMENTS**

* MATLAB 8.3 Version R2014a

**MATLAB**

The MATLAB high-performance language for technical computing integrates computation, visualization, and programming in an easy-to-use environment where problems and solutions are expressed in familiar mathematical notation.

* Data Exploration ,Acquisition, Analyzing &Visualization
* Engineering drawing and Scientific graphics
* Analyzing of algorithmic designing and development
* Mathematical functions and Computational functions
* Simulating problems prototyping and modeling
* Application development programming using GUI building environment.

Using MATLAB, you can solve technical computing problems faster than with traditional programming languages, such as C, C++, and Fortran.