INDIAN TRAFFIC SIGNBOARD RECOGNITION AND DRIVER ALERT SYSTEM USING CNN

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ABSTRACT

Traffic signs acknowledgment (TSR) is a significant piece of some propelled driver-help frameworks (ADASs) and auto driving frameworks (ADSs). As the main key advance of TSR, traffic sign recognition (TSD) is a difficult issue on account of various sorts, little sizes, complex driving scenes, and impediments. Lately, there have been countless TSD calculations dependent on machine vision and example acknowledgment. Right now, far reaching audit of the writing on TSD is introduced. We partition the identification techniques into two primary classes: sign based strategies, shape-based techniques. The proposed strategy is extensively isolated into, information preparing, information arrangement, preparing and testing. Framework utilizes assortment of picture handling systems to improve the picture quality and to evacuate non-educational pixel, and identifying edges. Highlight extractors are utilized to discover the highlights of picture. Propelled AI calculation Convolutional Neural Networks (CNN) is utilized to group the diverse traffic sign pictures dependent on their highlights by utilizing the continuous camera.

KEYWORDS: *Convolutional Neural Networks, Shape based techniques, learning based method, rotation.*

1.INTODUCTION

Currently, more and more intelligent transportation systems are developed for assisting drivers. Traffic sign recognition (TSR) is extremely important for safe and careful driving, as not only can this system inform the driver of the conditions of the road, but can also support the driver during the tedious task of remembering each of the many types of traffic signs. Some of the traffic sign information may sometimes be extracted from the GPS navigation data, but it is always neither complete nor up-to-date. Moreover, temporary speed limits for road works, as well as variable speed limits, are by registration not included in predefined digital cartographic data. Therefore, a visual real-time TSR system is a mandatory complement to GPS systems for designing advanced driving assistance systems. Traffic signs are designed using specific shapes and colors, which are highly salient and visible from the background against which they are set, enhancing their visibility to drivers. In-depth study of traffic sign datasets allows us to observe some common characteristics of traffic signs. In this paper, we propose a novel graph-based ranking and segmentation approach to detect salient regions, with specified colors, as traffic sign candidate regions. The proposed approach combines information pertaining to the colour, saliency, spatial, and contextual relationship of nodes for traffic sign detection, making it more discriminative and robust than other methods in addressing various illumination conditions, shape rotations, and scale changes of traffic sign images.

1.1 OB JECTIVE

This would reduce the road accidents and enhances safe driving. It would be great development for future use in autonomous vehicle. It presents a methodology to detect and recognize traffic signs in real time. The processing of image is faster and more cost effective. one needs less film and other photographing equipment. It is more ecological to process images.

1.2 SCOPE

Recognition of signboard correctly at the right time and at the right place is very important for drivers to insure themselves and their passengers' safe journey. However, sometimes, due to the change of weather conditions or viewing angles, signs are difficult to be seen until it is too late. Now a days increases in computing power have brought computer vision to applications. The road accidents is particularly high under special road conditions, such as at a one-way street, sharp curves, and intersections. One possible countermeasure is to install "STOP", "NO LEFT TURN" and other signs in order to notify the driver and other traffic information.

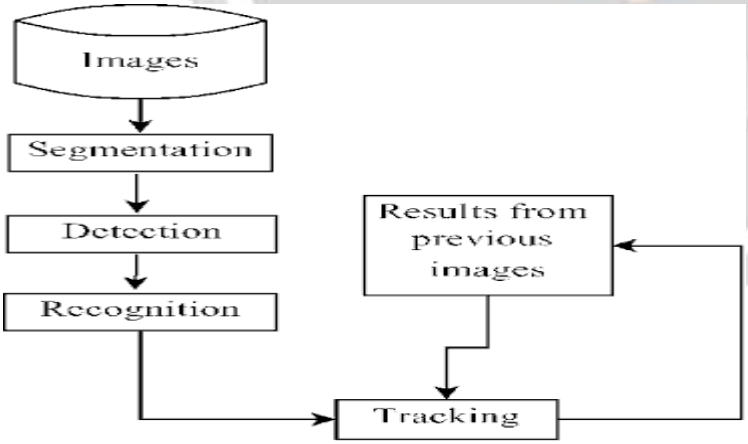
2. EXISTING SYSTEM

The proposed algorithm for detection and verification of road sign which consists of four distinct parts. candidate regions and to avoid the illumination sensitiveness of color . In the next part the region of interest is refined using labeling and filtering and different geometrical properties such as area, aspect ratio, perimeter for classification.

3. ROPOSED SYSTEM

We proposed the traffic sign detection methods by using advanced machine learning classification based methods. In recent years, with the development of advanced machine learning based detection methods (CNN) have gradually become the mainstream algorithms and achieved the-state-of-the-art results in some aspects. The CNN(CONVOLUTIONAL NEURAL NETWORK based TSD (Traffic Sign Detection) methods are reviewed according to their adopted advanced machine learning classification methods.

ARCHITECTURE



4..MODULES

4.1PREPROCESSING

Pre-processing is a common name for operations with images at the lowest level of abstraction both input and output are intensity images. The aim of pre-processing is an improvement of the image data that suppresses

unwanted distortions or enhances some image features important for further processing. Image pre-processing methods use the considerable redundancy in images.

4.2SEGMENTATION

Image segmentation is a commonly used technique in digital image processing and analysis to partition an image into multiple parts or regions, often based on the characteristics of the pixels in the image.

4.3CONVOLUTIONAL NEURAL NETWORK

The **Convolutional Neural Networks** (CNN) is one of the most famous deep learning algorithms and the most commonly used in image classification applications. In general, the CNN architecture contains three types of layers, which are convolutional layers, pooling layers, and fully connected layers.

4.3.1 IMAGE INPUT LAYER

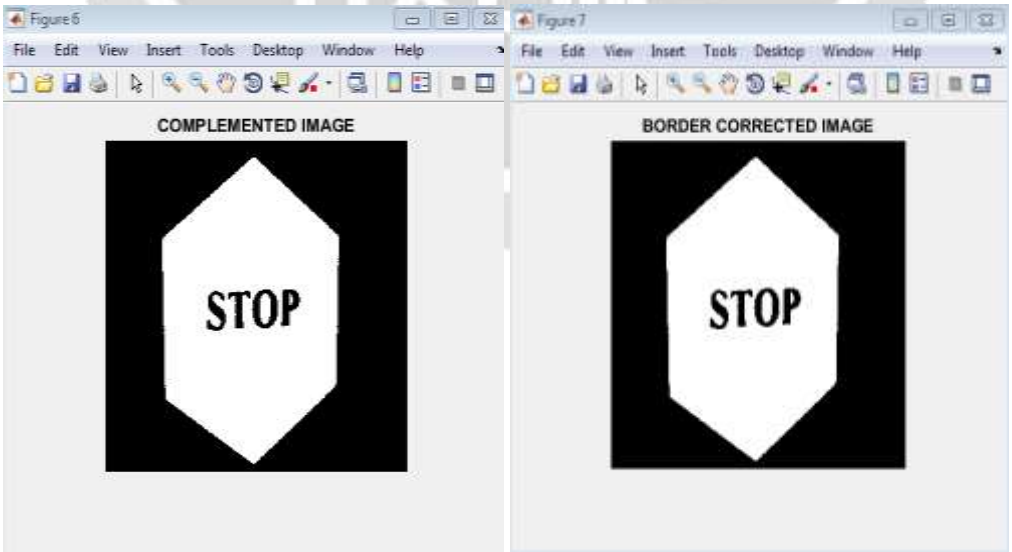
An image Input Layer is where you specify the image size, which, in this case, is 28-by-28-by-1. These numbers correspond to the height, width, and the channel size. The digit data consists of grayscale images, so the channel size (color channel) is 1. For a color image, the channel size is 3, to the RGB values. You do not need to shuffle the data because train Network, by default, shuffles the data at the beginning of training. Train Network can also automatically shuffle the data at the beginning of every epoch during training.

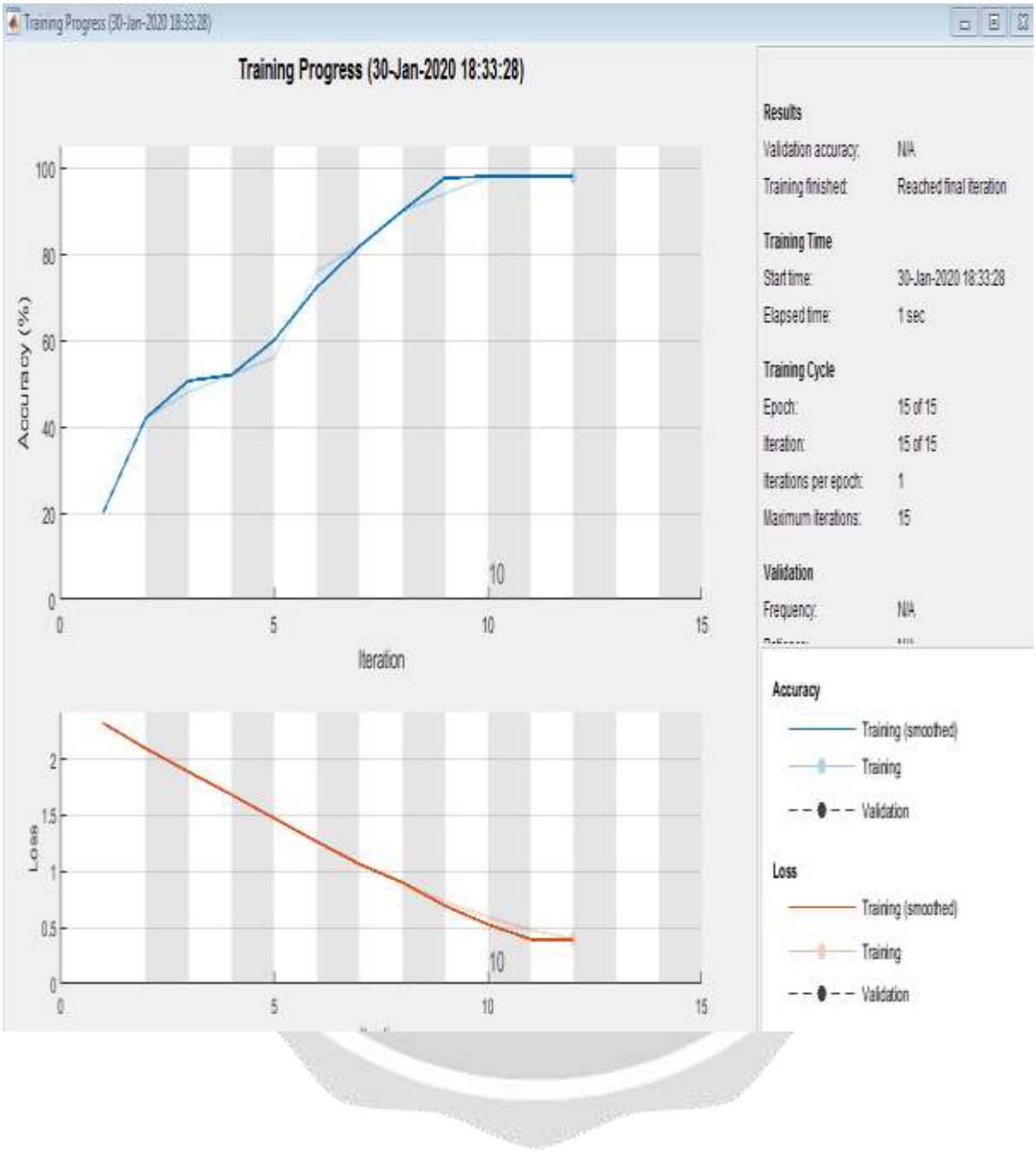
4.3.2CONVOLUTIONAL LAYER

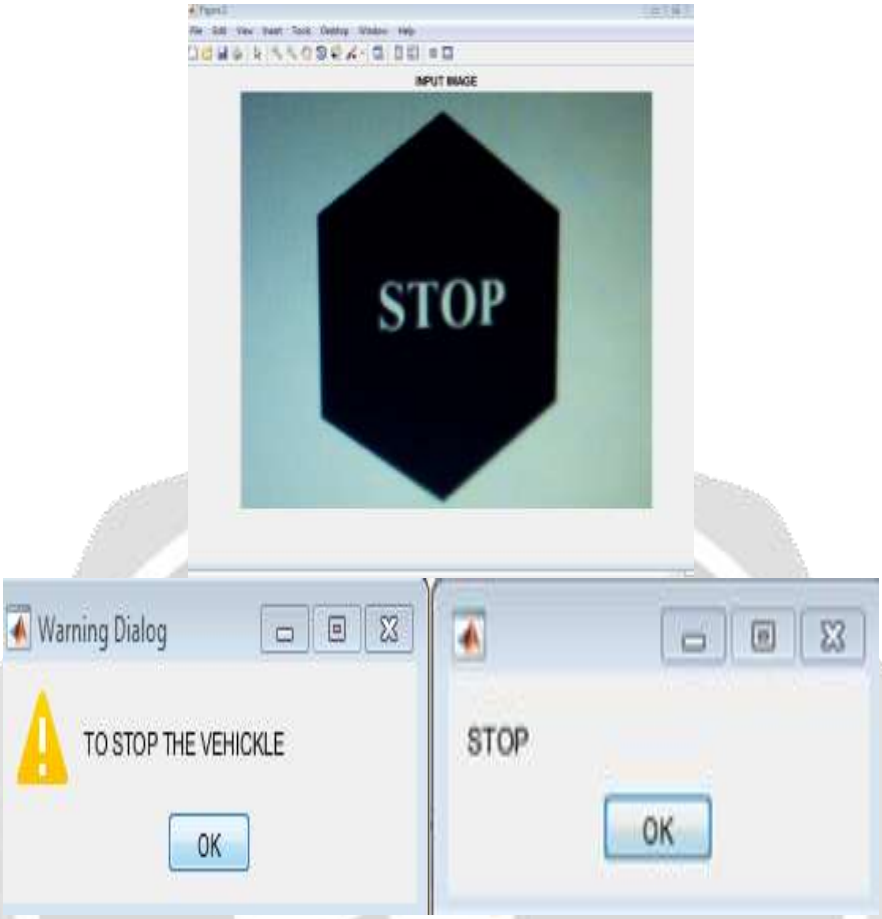
In the convolutional layer, the first argument is filter Size, which is the height and width of the filters the training function uses while scanning along the images. In this example, the number 3 indicates that the filter size is 3-by-3. You can specify different sizes for the height and width of the filter. The second argument is the number of filters, num Filters, which is the number of neurons that connect to the same region of the input. This parameter determines the number of feature maps. Use the 'Padding' name-value pair to add padding to the input feature map. For a convolutional layer with a default stride of 1, 'same' padding ensures that the spatial output size is the same as the input size. You can also define the stride and learning rates for this layer using name-value pair arguments of convolution2dLayer.

4.3.3RELU LATER

The batch normalization layer is followed by a nonlinear activation function. The most common activation function is the rectified linear unit (ReLU). Use reluLayer to create a ReLU layer.




Training Progress (30-Jan-2020 18:33:28)
Training Progress (30-Jan-2020 18:33:28)
Accuracy (%)
Iteration
Loss
Results
Validation accuracy: N/A
Training finished: Reached final iteration
Training Time
Start time: 30-Jan-2020 18:33:28
Elapsed time: 1 sec
Training Cycle
Epoch: 15 of 15
Iteration: 15 of 15
Iterations per epoch: 1
Maximum iterations: 15
Validation
Frequency: N/A
Accuracy
Training (smoothed)
Training
Validation
Loss
Training (smoothed)
Training
Validation



5. CONCLUSIONS

In this project, a comprehensive review of the literature on TSD is presented. We divide the reviewed detection methods into two main categories: color-based methods, shape-based methods. 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. Deep learning algorithm Convolutional Neural Network (CNN) is used to classify the images based on their features.

6.FUTURE ENHANCEMENT

In future, with more time and with more comprehensive research the proposed system can be made more accurate. Also new traffic sign detection algorithms can be added so as to give a wider variety of options to choose from.

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