Traffic Sign Detection Using CNN

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Abstract:

Road signs are important to ensure smooth Road flow without bottle necks or mishaps. Road symbols are the pictorial representations having different necessary information required to be understood by the driver. Road signs in front of the vehicle are ignored by the drivers and this can lead to catastrophic accidents. This paper presents an overview of the Road sign board detection and recognition and implements a procedure to extract the road sign from a natural complex image, processes it and alerts the driver using voice command It is implemented in such a
way that it acts as a boon to drivers to make easy decisions

Keywords: Traffic signs, camera, Sign detection, road signs CNN, recognition

I Introduction:

Road signs give out a number of messages regarding the road and what you as a driver should expect on the road. They keep the Road flowing freely by helping drivers reach their destinations and letting them know entry, exit and turn points in advance. Pre-informed drivers will naturally avoid committing mistakes or take abrupt turns causing bottlenecks. Road signs, indicating turns, directions and landmarks, also help to save time and fuel by providing information on the route to be taken to reach a particular destination. Road signs are placed in specific areas to ensure the safety of drivers. These markers let drivers know how fast to drive. They also tell drivers when and where to turn or not to turn. In order to be a terrific driver, you need to have an understanding of what the sign means.
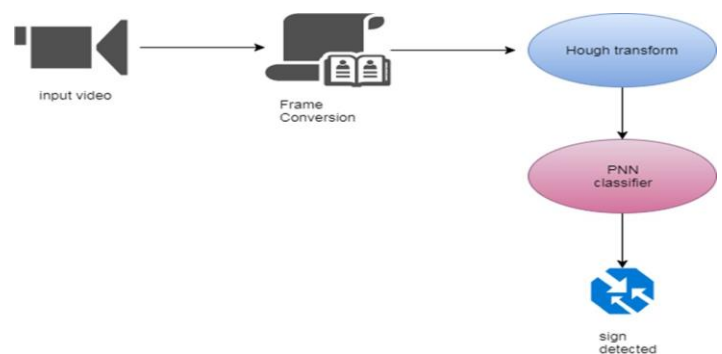
II Methodology:

Fig. 1. Block Diagram

The methodology of the proposed system is given below:

¨Our traffic sign recognition system consists of three stages: traffic sign regions of interest (ROIs) extraction, ROIs refinement and classification, and post-processing.

First, for each frame in the video, traffic sign ROIs are detected with Maximally Stable external Regions (MSERs) on multi-channel images. Then, to refine and classify the ROIs, a multi-task Probabilistic Neural Network (CNN) is proposed.

Specifically, the ROIs are first fed to a binary classification layer, and only the positive ones are further classified with a deep multiclass classification network.

The network is trained end-to-end with a large amount of data, which consists of training data, synthetic signs and images labeled from street view. Finally, recognition results from each frame are fused to get the final results of the video.
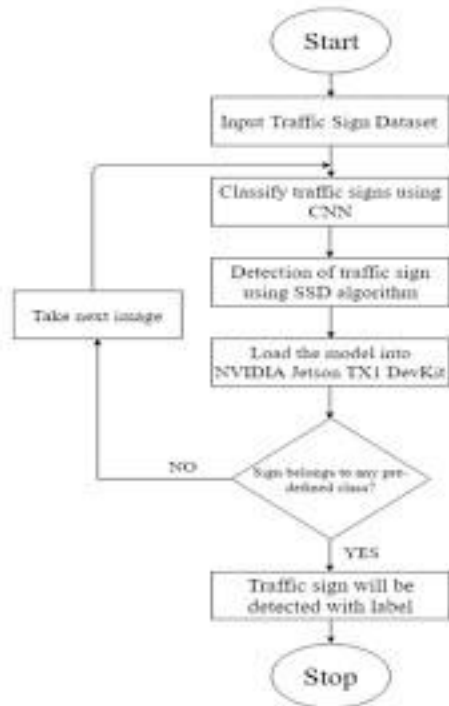
Fig. 2. Flowchart

III. Results and Analysis:

We propose a new data-driven system to recognize all categories of traffic signs in low quality short videos captured by a car mounted camera. The traffic sign ROIs are first extracted using MESRs on multi-channel images. A new multi-task CNN
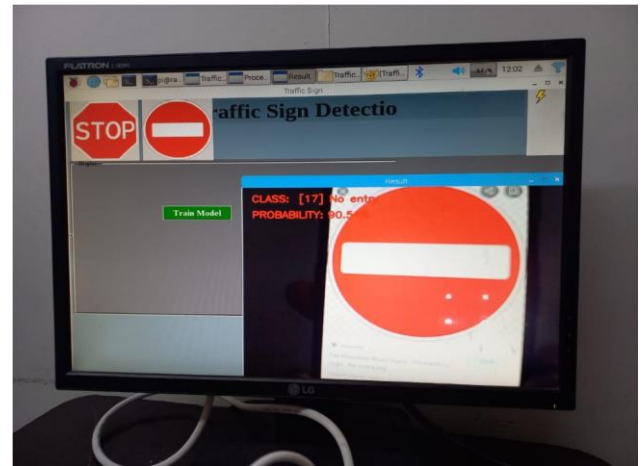

Fig.3. Software Result 1

structure is proposed to refine and classify the ROIs in a uniform framework. The recognition outputs of all frames are fused to get the final result for a video. Our system gets the state-of-the-art result on a challenging new data set.
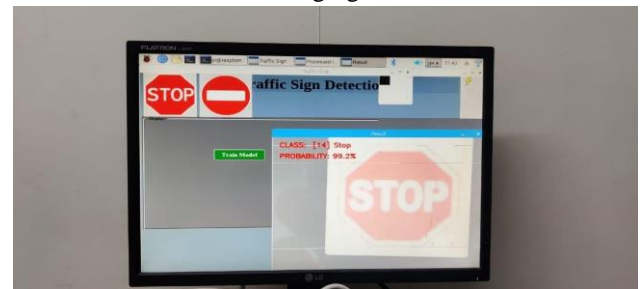

Fig. 4. Software Result 1(a)

Fig. 5 Software Result 3

In the above figures it is seen that the simulation detects the traffic signs.

Fig. 6. Hardware

Above image shows us the hardware of the simulation.

IV. Conclusion:

We propose a smart driver alert system which detects and recognizes Road signboard from video stream input and gives voice message to the driver. By using this technology we can reduce road accidents as well as regulate road safety.

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