

Traffic Sign Board Detection and Recognition using Convolutional Neural Network with Voice Alert.

Prof. Vishvas Kalunge¹, Priyanka Patil², Rucha Patil³, Mayuri Tamhane⁴, Nikita Nagalkar⁵

¹Professor, Dept. of Information Technology, JSCOE, Pune, Maharashtra, India

^{2,3,4,5} Dept. of Information Technology, JSCOE, Pune, Maharashtra, India

Department of Information Technology, Jayawantrao Sawant College of Engineering, Pune

Abstract -

To make sure a clean and comfortable drift of traffic, road signs are crucial. a prime purpose of street injuries is negligence in viewing the traffic signboards and decoding them incorrectly. The proposed device is educated the use of Convolutional Neural network (CNN) which allows in traffic sign image recognition and category. A Hard and fast of training are defined and trained on a specific dataset to make it greater correct. The German traffic sign Benchmarks Dataset was used, which includes about 43 categories and 51,900 photos of site visitors' symptoms. The accuracy of the execution is set **97.9 percentage**. Following the detection of the signal via the machine, a voice alert is sent through the speaker which notifies the driver. The proposed device additionally incorporates a section where the automobile driver is alerted approximately the traffic signs in the near proximity which enables them to be aware of what regulations to observe on the path. The purpose of this device is to make sure the safety of the car's driver, passengers, and pedestrians

Key Words: Convolutional Neural Network, GTSRB, Traffic Signs, Voice Alert

1. INTRODUCTION -

If drivers and pedestrians do no longer notice this data, it could result in the prevalence of driver's injuries. opposite to herbal landmarks with arbitrary look, traffic signs have trendy appearances including shapes, shades, and styles described in rules. Pixel-wise prediction method. streetsignal gives facts approximately to the drivers and pedestrian.

1.1 PROPOSED SYSTEM:

In our proposed machine, we develop the traffic sign Board recognition and Voice Alert system with the use of a Convolutional Neural network. Our device will be able to locate, understand and infer the street traffic signs could be a prodigious assist to the driver.

The goal of an automated avenue signs recognition gadget is to locate and classify one or extra street signs from inside live color snapshots.

In this base paper, we offer alertness to the driver approximately the sign the use of voice on the detected signboard. The machine gives the driver with actual-time facts from street signs. It consists of the most crucial and difficult duties. subsequent generate an acoustic caution to the driver in advance of any danger. This caution then permits the driver to take appropriate corrective choices a good way to mitigate or absolutely keep away from the event.

2.0 IMPLEMENTATION-

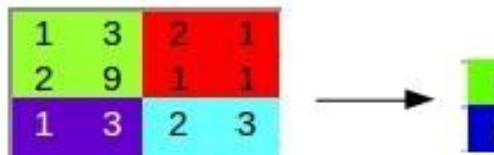
ConvNets are designed to method information that come within the form of multiple arrays, for instance a color snapshot composed of three 2d arrays containing pixel intensities in the three colour channels. Many information modalities are within the form of multiple arrays: 1D for alerts and sequences, along with language; 2d for images or audio spectrograms; and 3-D for video or volumetric snapshot. There are 4 key thoughts at the back of ConvNets that take benefit of the properties of herbal signals: In a convolutional network (ConvNet), there are basically three styles of layers:

1. Convolution layer
 2. Pooling layer
 3. fully connected layer
- Pooling Layers

Pooling layers are usually used to reduce the dimensions of the inputs and therefore accelerate the computation. remember a 4 X 4 matrix as proven beneath:

1	3	2
2	9	1
1	3	2

making use of max-pooling in this matrix will bring about a 2 X 2 output:



For every consecutive 2 X 2 block, we take the max quantity. right here, we've got applied a filter of length 2 and a stride of 2. those are the hyperparameters for the pooling layer. other than max pooling, we also can follow common pooling where, instead of taking the max of the numbers, we take their average. In precis, the hyperparameters for a pooling layer are:

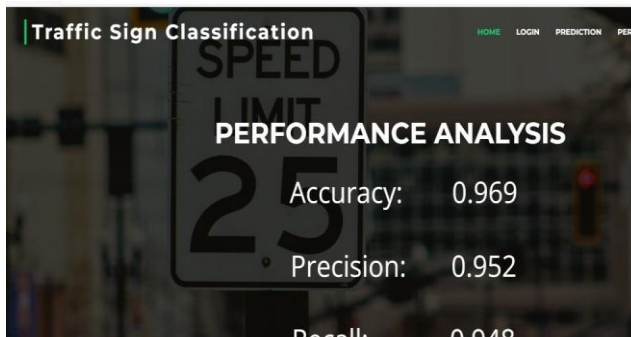
1. filter length
2. Stride
3. Max or average pooling

pyttsx3:

It is a text-to-speech conversion library in Python. in contrast to alternative libraries, it works offline and is wellmatched with each Python 2 and 3.

A software invokes the pyttsx3.init() factory feature to get a connection with a pyttsx3. Engine instance. it is a completely easy to apply tool which converts the entered textual content into speech.

The pyttsx3 module helps voices first is female and the second one is male that is provided by "sapi5" for windows.



3. CONCLUSIONS

The traffic sign Board Detection and Voice Alert device is carried out using Convolutional Neural network. various models under the CNN heading have been studied and the only with highest accuracy at the GTSRB dataset become applied. The advent 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 signal which alerts the driver, hence supporting him/her take appropriate selections. This paper is a giant advancement within the area of driving as it might ease the process of the driver without compromising on the safety aspect. Additionally, this device can effortlessly be carried out without the need of tons hardware as a result growing it attain.

FUTURE SCOPE-

The prototype may be increased to encompass a built-in alert device with a camera within the automobile's center. additionally, the function of having the expected time for achieving that specific traffic signal may be delivered. This machine can also be extended for the identification of traffic signals and therefore activate the person approximately the time to reach that specific signal and its fame as well. The user can hence plan their trip start time and for this reason, cross all alerts without having to attend. Also, the driver verification can be done with the assistance of an API presenting the data about the license holder and the license number.

REFERENCES

1. Y. Jia et al. (2014). "Caffe: Convolutional architecture for fast feature embedding."
2. M. Mathias, R. Timofte, R. Benenson, and L. Van Gool, "Traffic sign recognition?" in Proc. IEEE Int. Joint Conf. Neural Netw., Aug. 2013, pp. 1-8.
3. Hasan Fleyeh, Mark Dougherty, "Road and Traffic Sign Detection and Recognition", Department of Computer Engineering, Dalarna University, Sweden
4. Wang C Y, "Research and application of traffic sign detection and recognition based on deep learning," International Conference on Robots & Intelligent System (ICRIS), 2018
5. L. Abdi, "Deep learning traffic sign detection, recognition and augmentation," Proceedings of the Symposium on Applied Computing, Maroc, 2017, p. 131-136
6. Yadav, Shubham & Patwa, Anuj & Rane, Saiprasad & Narvekar, Chhaya. (2019). Indian Traffic Sign Board Recognition and Driver Alert System Using Machine Learning. International Journal of Applied Sciences and Smart Technologies. 1-10. 10.24071/ijasst.v1i1.1843.
7. Anushree.A., S., Kumar, H., Iram, I., & Divyam, K. (2019). Automatic Signboard Detection System by the Vehicles
8. S. Harini, V. Abhiram, R. Hegde, B. D. D. Samarth, S.
A. Shreyas and K. H. Gowranga, "A smart driver alert system for vehicle traffic using image detection and recognition technique," 2017 2nd IEEE International Conference on Recent Trends in Electronics, Information & Communication Technology (RTEICT), Bangalore, India, 2017, pp. 1540-1543, doi: 10.1109/RTEICT.2017.8256856
9. C. Wang, "Research and Application of Traffic Sign Detection and Recognition Based on Deep Learning," 2018 International Conference on Robots & Intelligent System (ICRIS), Changsha, China, 2018, pp. 150-152, doi: 10.1109/ICRIS.2018.00047.