Traffic Sign Classification

Team

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Project Idea

Traffic Sign Identification is significant in autonomous driving in the same way as a human will not get a driver's license unless he/she can recognise the traffic signs. The information obtained by the traffic signs is used as a feedback in autonomous driving. This information when used properly, can serve as one step ahead in errorless self-driving cars. The problem we propose is to classify and recognize various traffic signs with the help of traffic signs images captured. The performance metrics used will be accuracy, precision, ROC curve.
Image preprocessing of the data will be done using Histogram Equalization (HE), median filter (MF). [1] The algorithms proposed to train the classifier are Convolutional Neural Networks (CNN) [2], Transfer Learning using TensorFlow ResNet model [3] and K-Nearest Neighbors. A comparison of all the results will be made to know which algorithm model performs better.

Dataset

The dataset consists of over 50000 images containing 43 classes of traffic signs. It is collected from video recordings while driving on different road types in Germany during daytime. The class frequency of images in dataset is imbalanced [2].

Link to dataset-
https://sid.erda.dk/public/archives/daaeac0d7ce1152aea9b61d9f1e19370/published-archive.html

References

[1] R. Vicen-Bueno *et al*, "Traffic sign classification by image preprocessing and neural networks," in *Computational and Ambient Intelligence,* 2007, .
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[3] Pavel Surmenok, "ResNet for Traffic Sign Classification With PyTorch," Feb 26, 2018.
[4] J. Stallkamp *et al*, "The German Traffic Sign Recognition Benchmark: A multi-class classification competition," *The 2011 International Joint Conference on Neural Networks,* pp. 1453-1460, 2011. . DOI: 10.1109/IJCNN.2011.6033395.