Python for Deep. Learning Project Proposal

Traffic Signs Recognition

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Goals and Objective

Today in the age of autonomous vehicles, companies such as Tesla, Benz, Audi, Ford, GMC works on models to improve their accuracy in self driving and autonomous cars to able to recognize the roadblocks and traffic signs for a smooth and safe travel.
Therefore, we would like to build a model that has maximum accuracy in detecting the traffic signs on roads and make the decisions accordingly.

In this project we are going to build a Neural Network Model that can able to classify the type of image it comes under several classes with maximum accuracy possible. Finally, we try to create an interface to upload an image and get the classification result by loading the trained Neural Network Model.

Features

Our Dataset is from : http://benchmark.ini.rub.de/?section=gtsrb&subsection=dataset
Which has,

- Single-image, multi-class classification problem
- More than 40 classes
- More than 50,000 images in total
- Large, lifelike database

We would like to build a Convolutional Neural Network (CNN) Model to classify the images into respective categories. Moreover, CNN is best for image classification purposes.

Technologies, Libraries, Frameworks

- Numpy
- Pandas
- Matplotlib
- Pillow
- Tensorflow
- Keras
- Tkinter Toolkit

References

https://www.tensorflow.org/tutorials/quickstart/beginner

https://www.kaggle.com/meowmeowmeowmeowmeow/gtsrb-german-traffic-sign

https://hackernoon.com/traffic-sign-recognition-using-convolutional-neural-network-8a1f90e8fb24

https://towardsdatascience.com/recognizing-traffic-signs-with-over-98-accuracy-using-deep-learning-86737aedc2ab

Future Work

To convert the TensorFlow model we built into TensorFlow Lite model and run in Mobile devices such as Android. But this is our long-term goal, as TensorFlow Lite is still in developing phase where one can better use already developed models by google, rather than converting our own TensorFlow model.