

PROJECT

Traffic Sign Classification

A part of the Self Driving Car Engineer Nanodegree Program

PROJECT REVIEW

CODE REVIEW

NOTES

SHARE YOUR ACCOMPLISHMENT!  

Meets Specifications

Dear Student,

Congratulations ✨ on successfully completing this project! You put in a lot of effort into this project and it shows! Firstly, you've really done a great job! You put in a lot of effort into this project and it shows! ✨ I loved reviewing 🧐 your project you have done the hard part and also used the ConvNet architecture instead of a simple Feed Forward Network. I've enjoyed very much reviewing your submission, which demonstrates your deep knowledge of machine learning. 😊 Great job with the softmax probabilities visualizations. 🙌 You've now taken a major stride forward in this Term. Keep up the good work and all the best for your future projects! ✨ I wish you all the success for your next submission. 😊

Extra Important Material

Lately on slack few students asked for a good Deep Learning book. So after lot of research found a book which is also recommended by Elon Musk

- *Deep Learning (Adaptive Computation and Machine Learning series)* [Github](#) and on [Amazon](#)
Few more 😊
- [Fast.ai](#)
- [A Guide to Deep Learning](#)

Few Articles

[Traffic sign classification using brightness augmentation](#)
[Dealing with unbalanced data](#)

Dataset Exploration

	✓
Student performs basic data summary.	
Good job performing a basic data summary to come up with the correct figures. 🙌	
	✓
Student performs an exploratory visualization on the dataset.	
You've done a great job with the visualizations 🎯 <ul style="list-style-type: none">• The traffic signs have been plotted.• The histograms showing the number of images for each of the class labels has been displayed. 🙌	

Design and Test a Model Architecture

	✓
Students provides sufficient details of the preprocessing techniques used. Additionally, the student discusses why the techniques were chosen.	
<ul style="list-style-type: none">• All the preprocessing techniques used are perfectly justified.• Well done backing up those choices with concise explanations. 🙌	



Student provides sufficient details of the characteristics and qualities of the architecture, such as the type of model used, the number of layers, the size of each layer. Visualizations emphasizing particular qualities of the architecture are encouraged.

- Your architecture is perfectly justified in this situation. 🤔
- The characteristics of the final architecture used have been adequately justified.

Suggestion

- To add an extra punch to your report, you may consider adding a visualization of the final network showing the connections between the different layers.
- To make this answer even better, you can also produce a visualization emphasizing particular qualities of the architecture.
I would like to invite you to take a look at [tensorboard](#) a tool for visualizing your models made with tensorflow



Student describes how the model was trained and evaluated. If the student generated additional data they discuss their process and reasoning. Additionally, the student discusses the difference between the new dataset with additional data, and the original dataset.

- The data has been split correctly.
- The decision to use Adam optimizer is correct.
- The parameters used to train the model have been mentioned.

Extra Materials

- I noted a [linkage here](#) to discuss about how should we choose the batch_size of Stochastic Gradient Decent
- Since you might be interested into "Adam Optimizer", here is a [website](#) that talks about it.
- You might like to learn the whole idea of [Dropout](#) 😊 It's gives a brief analysis of the technique.



Student thoroughly discusses the approach taken for deriving and designing a model architecture fit for solving the problem given.

- The overall approach used to arrive at the final model has been adequately discussed. 100

Test a Model on New Images



Student chooses five candidate images of traffic signs taken and visualizes them in the report. Discussion is made as to any particular qualities of the images or traffic signs in the images that may be of interest, such as whether they would be difficult for the model to classify.

- All the candidate images chosen are appropriate.
- Well done identifying the characteristics of the new images that might make it difficult for the classifier to predict. 👍



Student documents the performance of the model when tested on the captured images and compares it to the results of testing on the dataset.

- The performance of the model has been appropriately compared in the two cases. 100



The softmax probabilities of the predictions on the captured images are visualized. The student discusses how certain or uncertain the model is of its predictions.

- Great job visualizing the softmax probabilities. 😊
- The certainty of the model's predictions have been mentioned.

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