Parsimonious Semantic Segmentation Training Using Active Learning and Synthetic Data

The goal of this thesis is to implement an augmentation pipeline for both runtime accuracy improvement and training time generalization. At training time the augmented examples add diversity to the dataset, while at runtime the augmentation injects more information in addition to the RGB color channels, to help the CNN detect semantic segmentation features. The thesis will also explore different loss formulas and loss learning to make training semantic segmentation easier with fewer labeled examples. Finally, the CNN will be pruned and quantized for faster execution, while the rest of the processing (pre, post) pipeline will be accelerated on GPU.

Prerequisites

To successfully complete this project, you should have the following skills and experiences:

- Good programming skills in Python and Tensorflow
- Good knowledge of neural network training theory
- Experience with convolutional neural networks for semantic segmentation

The student is expected to be highly motivated.

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