Stop Sign Detection Report

Abstract

We try to solve the task of stop sign detection using deep learning.

Introduction

Stop sign detection is an important problem to solve if we are ever to achieve fully autonomous vehicles. In addition to being accurately being able to detect stop signs, we need to have the detection fast, as vehicles only have seconds to make decisions while navigating the road. We will attempt to solve the problem of stop sign detection by using object detection models.

Method

We will use quick Object Detection CNN's to detect stop signs on a set of images and compare how each model does in terms of accuracy and speed.

Experiment

We will use transfer learning to retrain an object detector model to detect stop signs, then we will run against a test set to and record metrics. We will be comparing YOLO and Fast RNN to see which does better. We might also compare against a multivariate gaussian classifier.

Conclusion

Model X performs much better in terms of accuracy, but model Y performs better in speed.

References

YOLOv3 PyTorch Implementation, https://github.com/eriklindernoren/PyTorch-YOLOv3
Andreas Møgelmose, Mohan M. Trivedi, and Thomas B. Moeslund, "Vision based Traffic Sign Detection and Analysis for Intelligent Driver Assistance Systems: Perspectives and Survey," IEEE Transactions on Intelligent Transportation Systems, 2012.