

EE 368 Project Proposal

Traffic Sign Recognition for Vision-based Driver Assistance in Land-based Vehicles

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Motivations

Autonomous vehicle has been an active area of research for a few decades. And intensive research has been done on using a front viewing camera for vehicle localization and navigation, environment mapping, and obstacle avoidance. In this project, I want to look into various digital-image-processing algorithms for detection and classification of traffic signs, and compare the performance under different image qualities.

Objectives

The main objective of this project is to successfully detect traffic signs from a stationary image of a normal street scene. The algorithm should also be able to extract features from the traffic signs and find the best match from predefined templates. The algorithm should also be robust towards variation of the quality of the images.

Potential Challenges

Depending on the quality of the images, several challenges can be anticipated. The first challenge is to restore the distortion of the signs due to relative orientation between the signs and the camera. Another challenge is how to effectively detect the edges of the signs when they are blended in with the background. Also, it could be potentially challenging to extract features from an image due to various illumination conditions (e.g. the picture was taken at night). Finally, in a scenario when the traffic sign is partial blocked by a tree, or the sign is cut off by the boundary of the picture, it will be difficult to detect and match the partial sign.

References

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