

Prediction of Traffic Behavior for Autonomous Driving

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Project Description

- Multi-target Tracking of Vehicles
 - Estimates the position, velocity, and acceleration of these objects
 - Uses sensory data (e.g. camera, LIDAR, infrared, etc.) to understand the environment in order to perform estimation
- Prediction of the behavior of tracked vehicles
 - E.g. lane change, acceleration, deceleration, constant velocity, etc.
 - Allows the vehicle to avoid collisions by knowing the probability of each behavior/scenario



Objective(s)

- Develop strategies to predict traffic behavior
- Utilize estimation & tracking techniques, e.g.
 - Kalman Filter (KF)
 - Smooth Variable Structure Filter (SVSF)
 - SVSF-IMM
 - SVSF-PDA

Tasks/Plan

- Learn and apply various estimation and tracking algorithms
- Mathematically model the behaviors to use the estimation and tracking algorithms
- Review open literature
- Develop algorithms to predict traffic behavior
- Implement the approaches to work with experimental sensor data

Expected Outcome & Deliverables

- Create a traffic behavior predictor
- System should predict the behavior of objects detected from sensors (camera, LIDAR, infrared, etc.)



Progress Report

- Learned the background material for estimation theory
 - Linear Dynamical Systems and Stochastic Processes
- Learned some of the filtering algorithms
 - Kalman Filter
 - Extended Kalman Filter
 - Unscented Kalman Filter
 - Smooth Variable Structure Filter
- Working on literature review
- Learning other estimation techniques
- Studying research papers

