

CarND-Path-Planning-Project

Reflection

Based on the provided code from the seed project, the path planning algorithms start at `src/main.cpp` .

The code consist of three parts:

Prediction

The sensor fusion data received from the simulator in each iteration is parsed and trajectories for each of the other cars on the road are generated. The best trajectory for our car is calculated by checking the lane in which each other car is and the position it will be at the end of the last plan trajectory. A car is considered "dangerous" when its distance to our car is less than 30 meters in front or behind us.

Behavior line

This part decides what to do:

If we have a car in front of us, do we change lanes?

Do we speed up or slow down?

Based on the prediction of the situation we are in, this code increases the speed, decrease speed, or make a lane change when it is safe.

Also the first priority of the car is center lane. If the centre lane is free, the car will always try to move back to the center lane.

Trajectory

This code does the calculation of the trajectory based on the speed and lane output from the behavior, car coordinates and past path points.

First, the last two points of the previous trajectory (or the car position if there are no previous trajectory) are used in conjunction with three points at a far distance to initialize the spline calculation. To make the work less complicated to the spline calculation based on those points, the coordinates are transformed (shift and rotation) to local car coordinates

In order to ensure more continuity on the trajectory (in addition to adding the last two point of the pass trajectory to the spline adjustment), the pass trajectory points are copied to the new trajectory . The rest of the points are calculated by evaluating the spline and transforming the output coordinates to local coordinates.