

1) How is lane following achieved?

In this project, the path of the car is laid out by having the car follow a list of coordinates. It then uses the Frenet coordinates to stay inside a lane.

2) How to use spline to generate a smooth trajectory?

We use spline to generate a smooth trajectory by keeping track of the car's previous trajectory and creating a path that is tangent to the angle of the car. Since a spline is a piecewise by polynomials function, it creates a smoother trajectory than a linear function. Then, instead of recreating the path from scratch, we just add points onto it and work with what's left from before. With points that are spaced along the spline, we are able to manage the car's speed.

3) How to avoid collision with the car in front?

We avoid collision with the car in front by going through the sensor fusion list and seeing if a car is in our lane and its distance to us. We then check if our car, in the future, will end up further than the other car, in the future, with the current speeds and adjust our speed or trigger a lane change accordingly.

4) How to avoid cold start?

We avoid a cold start by having a starting speed of 0 and speeding up by using the same logic of speeding up after having slowed down behind a car in our lane.