The core algorithm in this submission makes use of the following techniques:

**Using remaining previous path points as starting reference**
A total of 50 points is sent to simulator for driving. We use the unused way points from previous prediction and add the remaining way points.

**Use Frenet coordinates: add 30m, 60m, ad 90m points ahead**
It is much easier to work in Frenet coordinate system than cartesian for generating the future way points. We use last two way points from previous path as starting point. Furthermore, we find Frenet coordinates for finding the future 30m, 60m, and 90m way points. This is gives us a set of 5 way points.

**Use car's own frame of reference for extrapolating the future way points**
We transform 5 way points from the last step into the car's own frame of reference. This provides ease in computation.

**Using spline for smoother driving experience**
We fit a spline on the 5 transformed way points. Use of spline ensure a smooth path generation. We predicts future points on this spline and generate 50-(count of unused points from previous path). At last, we transform the points back into cartesian.

**Lane Change Criteria**
The car drives at 49.5 mph constantly till there a car in front of it. Then, we look at the other available lanes for lane-change.

1. Change lane when there is a car (<= 30 meter) on the front in the same lane
2. Select a lane with no other car 30 meter ahead on the target lane and 20 meter behind
3. Slow down the car if there is no permissible lane to change to
4. Speed up the car if less than 49.6 mph