UDACITY

< Return to "Self-Driving Car Engineer" in the classroom

DISCUSS ON STUDENT HUB

# Model Predictive Control (MPC)

REVIEW

CODE REVIEW 3

HISTORY

## Meets Specifications

Congratulation! You have now passed the project! 👏🏽

### Compilation

**Code must compile without errors with `cmake` and `make`.**

**Given that we've made CMakeLists.txt as general as possible, it's recommend that you do not change it unless you can guarantee that your changes will still compile on any platform.**

The code compiles without errors, good job!

### Implementation

**Student describes their model in detail. This includes the state, actuators and update equations.**

Kinematic equations are included in the write-up, together with description of states and actuators, showing your understanding of MPC. Well done!

**Student discusses the reasoning behind the chosen *N* (timestep length) and *dt* (elapsed duration between timesteps) values. Additionally the student details the previous values tried.**

Good observation. In general, smaller dt gives better accuracy but that will require higher N for given horizon (N*dt). However, increase N will result in longer computational time. I would first determine the predicted horizon that cover the given waypoints for optimal performance. Then we need to find a fine balance between N and dt. The most common choice of values is N=10 and dt=0.1.

**A polynomial is fitted to waypoints.**

**If the student preprocesses waypoints, the vehicle state, and/or actuators prior to the MPC procedure it is described.**

You have implemented coordinate conversion and polynomial fitting correctly as evidenced from the waypoint plotting in the simulator. Nice!

**The student implements Model Predictive Control that handles a 100 millisecond latency. Student provides details on how they deal with latency.**

You have implemented update equations to predict the states 100ms into future before sending them to MPC. Therefore the solutions returned by MPC will be meant when the actuators receive them after the latency has elapsed. Well done!

## Simulation

**No tire may leave the drivable portion of the track surface. The car may not pop up onto ledges or roll over any surfaces that would otherwise be considered unsafe (if humans were in the vehicle).**

**The car can't go over the curb, but, driving on the lines before the curb is ok.**

The MPC waypoints follow the given path closely and your car drives itself smoothly and completed the lap! Great job!

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3 CODE REVIEW COMMENTS ›

RETURN TO PATH

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