Project: PID Controller

Akhil Waghmare

July 2018

Simulator video **here**.

Component Analysis

P Component

- Adjusts steering in proportion to cross-track error (CTE)
- Accounts for present value CTE
- Higher value: causes very sharp turns
- Lower value: very subtle turns, leading vehicle off-track

I Component

- Adjusts steering in proportion to total CTE over time
- Accounts for inherent steering bias in the vehicle
- Higher value: Overreacts to bias, causing vehicle off the track
- Lower value: Vehicle offset from trajectory (away from middle of road)

D Component

- Adjusts steering in proportion to change in CTE from previous step
- Accounts for overshooting of the controller
- Higher value: Overreacts to overshooting, counter steers too much
- Lower value: Little or no counter steering

Tuning Hyperparameters

The hyperparameters (proportionality coefficients) were manually tuned. Initially, they were chosen to match those in the lessons. Then, almost by a process of manual twiddling, the values were adjusted little by little and track performance was compared.