PID Controller Project

For this Udacity project I had to build a PID controller to drive the car in the Udacity simulator. The goal was to get the car to drive as smooth as possible and stay on the road, similar to the deep learning project last term. However, this was the “robotics” approach.

Below is a graph from Sebastian’s PID class in python. You can see the effect of adding control variables and how they increase the effectiveness of the controller. P or error causes a “under damped” system while keeping the system within some sort of range. Adding D, or derivative control is a great step. This allows the error to decrease and slowly approach the reference line, it still leaves room for improvement. Lastly I or system error rounds out the controller by taking care of any wheel misalignment or other systemic error.

I found twiddle rather cumbersome in C++ and was able to tune parameters to the point where I felt twiddle would make no noticeable improvement. I’m pretty happy with how my car drives but I am very much looking forward to the predictive control section!