# **Udacity-CarND-Term2-PID**

This repository holds the code for the Udacity Self Driving Car Engineer Term 2 PID project.

## **Describe the effects the P, I, and D components have on parameter tuning**

### **P - Proportional**

This term is directly proportional to the distance the car deviates from the desired track in the y dimension. This deviation is known as Cross Track Error, CTE for short.

Kp is the tuning parameter for CTE and is simple multiplied (in the negative) by CTE.

### **I - Integral**

This term deals with systematic bias by correcting in proportion to the integral of CTE over time, which is calculated as the sum of CTE in my code.

### **D - Differential**

This term balances the overcorrection that can occur from the P term. It uses the differential between this CTE and the CTE from the previous time-step. If the correction is too fast (leading to large differential), we can slow our correction in proportion to the differential.

## **How did you choose your parameters?**

I used the Twiddle method described by Sebastian, and added a twiddle method the PID class.