CSE461 Assignment 2

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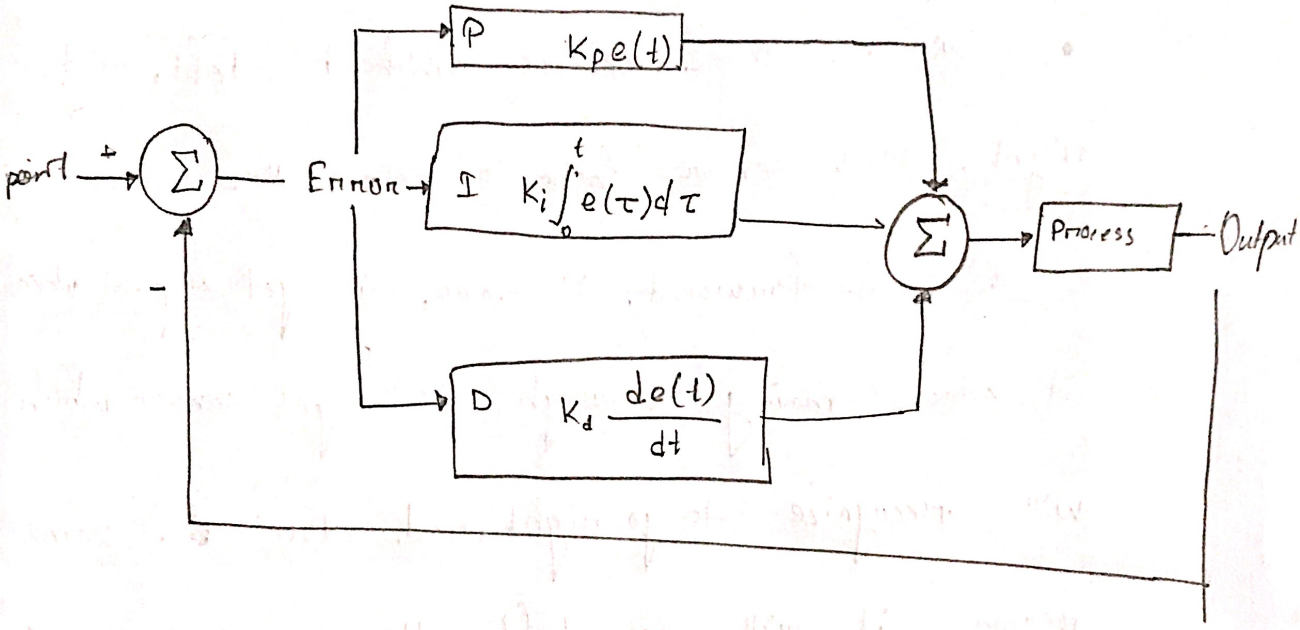
- I will use distance sensor to follow the line. Distance sensor use infrared sensor (IR) that will receive a signal from the line which it is following.

- I will use three sensors which is left, mid, right. Mid sensor help to follow the track and move forward. Moreover, it get signal when it starts moving through the right sensor which will recognize to go right and also the same reason it will go left. However, we can use more than three sensors to get better result. For instance, left midle and right middle.

- I will calculate error movement and implement it in my PID algorithm as follows:

The error will be 0 while the robot is on the track moving forward.

Moreover, threshold value should be set when the right sensor get more value than that an means it's going right. Therefore, error will be set to -1 and also for left sensor it will be 1.



A setpoint is initialized and an input is given. The deviation is occured in the input setpoint which is error. Then P, I, D is run into those. The value of PID is processed and send into main process which gives the final output. After that the output is fed with the input.

- K and P are the resulting gain and Oscillation period respectfully as follows:

For P control,

$K_p = 0.5K$

for PI control,

$K_p = 0.45k$

$k_i = 1.2/P$

for PID control,

$K_p = 0.6K$

$k_i = 2.0/P$

$K_d = P/8.0$

Zieglen – Nicholas Tuning for second or higher order systems.