ECE 3 Fall 2020 Lab Section 5 Notes – Sensory Inputs

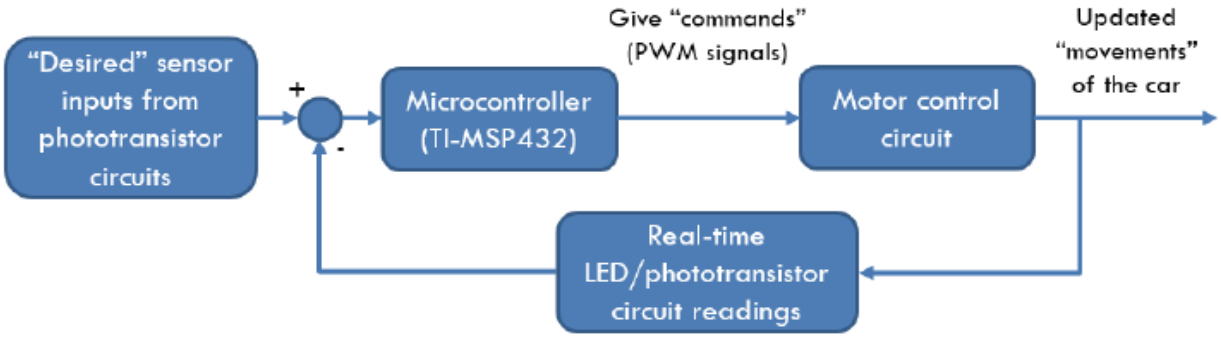
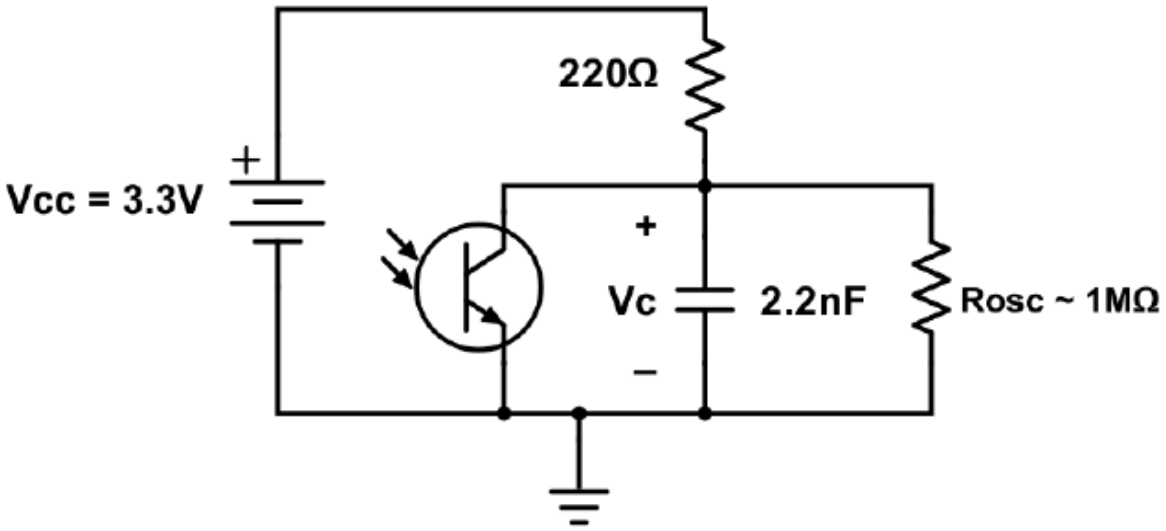


FIGURE 3-1: High level understanding of the ECE3 class project

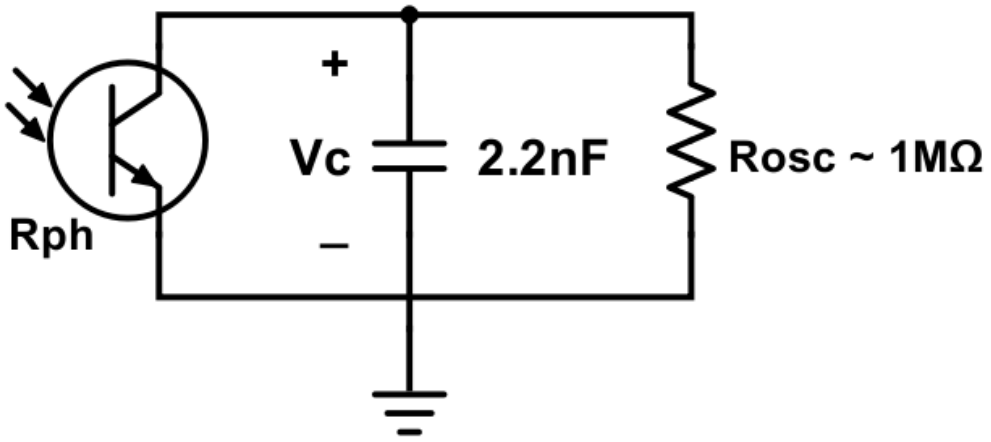
Working Mechanism of the phototransistor circuitry:

Charging:

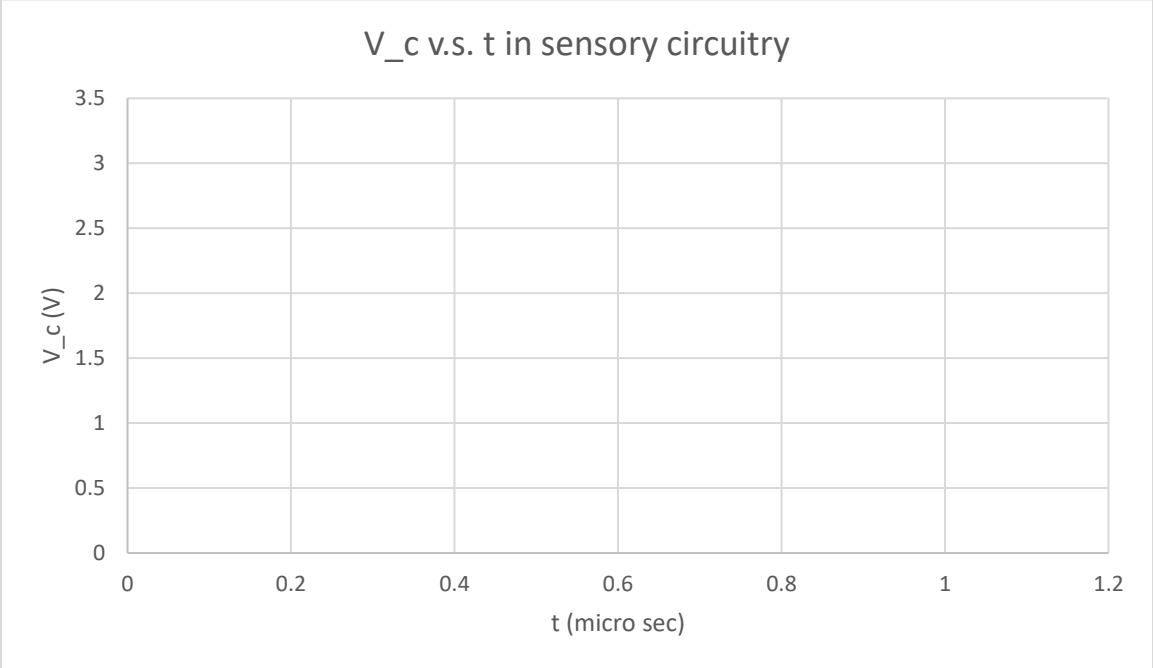


$$\tau_c = C(R_{220}//R_{ph}//R_{1M}) \approx 220\Omega \times C$$

Discharging:



$$\tau_c = C(R_{ph}//R_{1M}) \approx R_{ph} \times C$$



Total time needed to wait for each read?

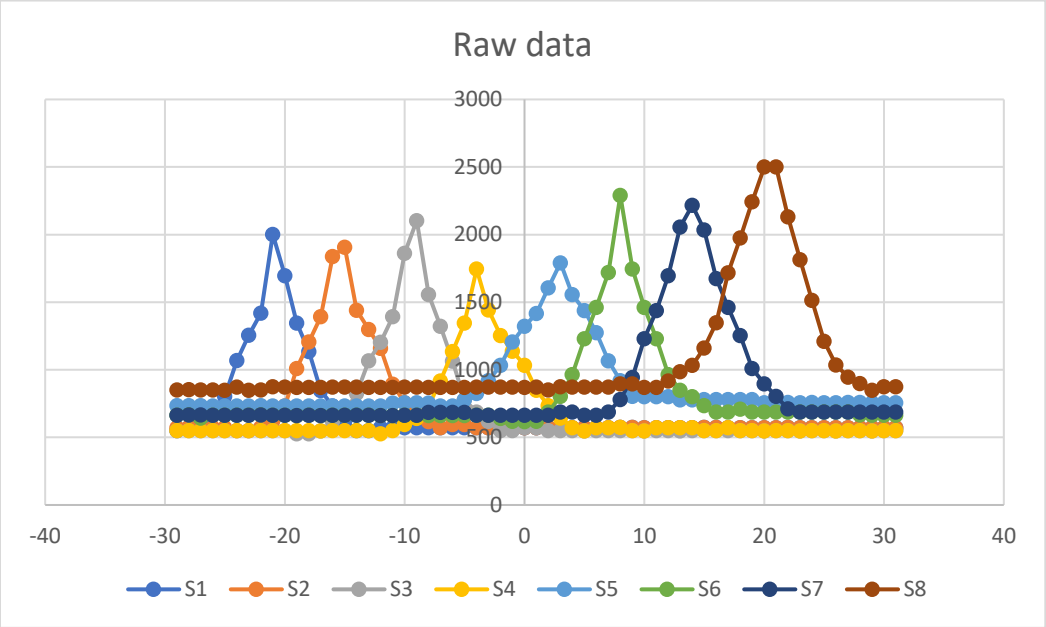
In our project setting: We read the discharging time from 3.3V to 1V as the sensory input data (0-2500)

White surface:

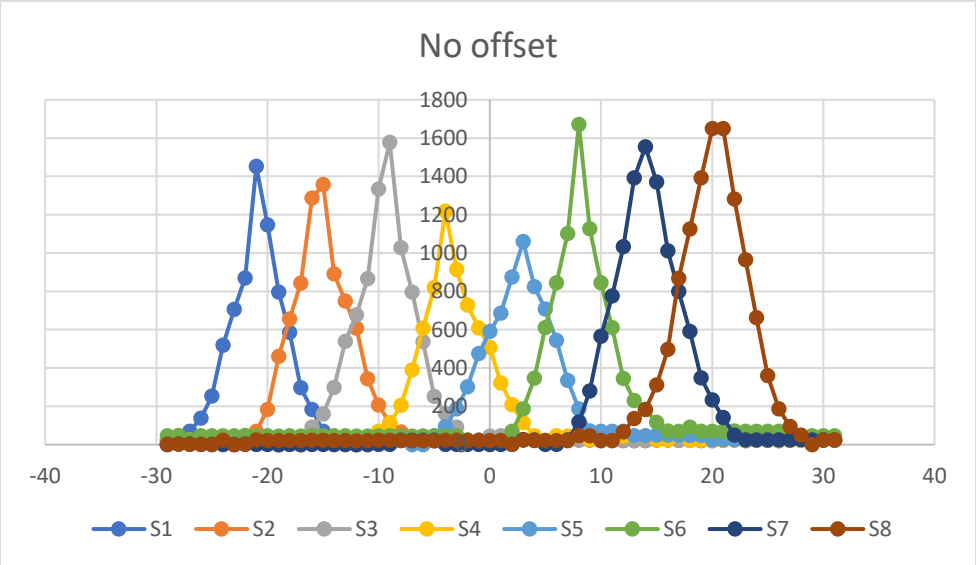
Black surface:

Sensory data fusion:

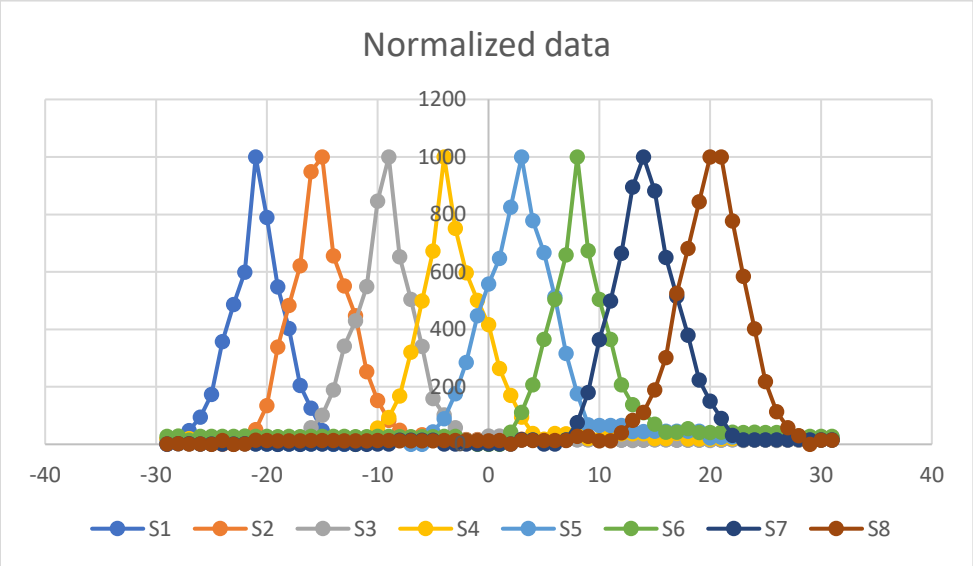
Raw data:



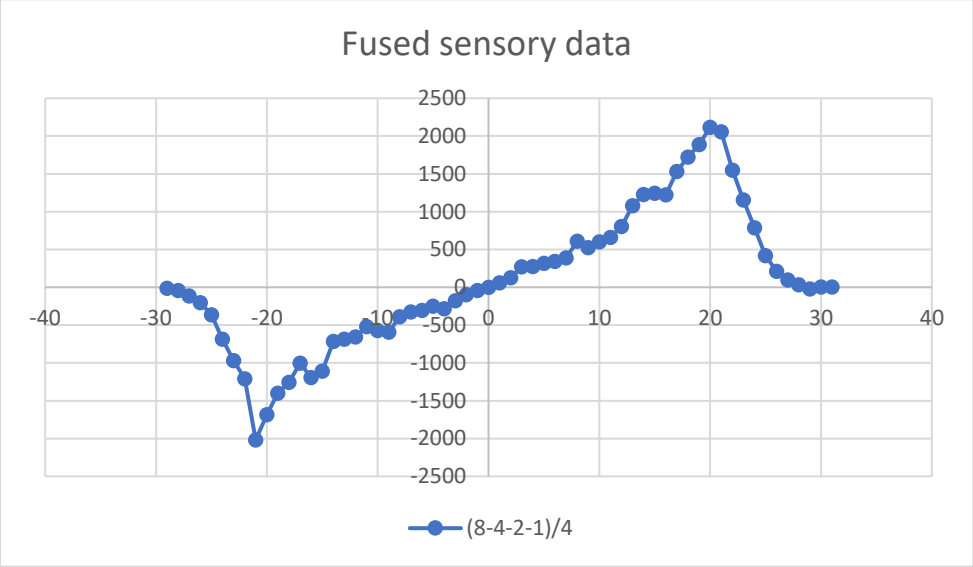
Kill the offsets:



Normalize through scaling:



Sensor fusion:



“Pseudocode” of our project: