

EECS192 Lecture 8

Mar. 7, 2017

Notes:

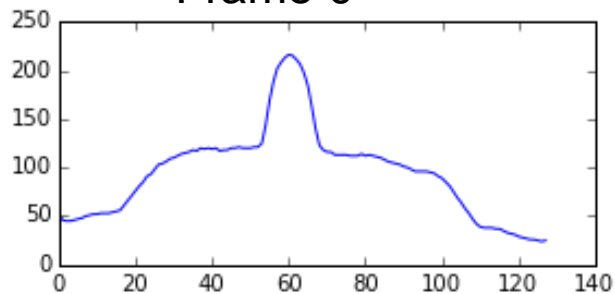
1. Check off-
 1. 3/10/2017: drop-and-run, velocity control, open loop fig 8
 2. 3/17/2017 Closed loop figure 8 drop and run
2. Quiz 4 line sensor 3/14
3. Community Spirit: PCB peer review, Piazza, helping fellow students
4. CalDay Sat. April 22 @ UCB,
5. Parts orders: Digikey only. Check out ACE hardware for other parts. Order own parts Sparkfun, Adafruit...
6. Line sensor processing HW1 due 3/14 – upload Python code to bcourses. (Will run on other data.)
7. Waterfall plot for line data
8. Lab safety/hygiene

Topics

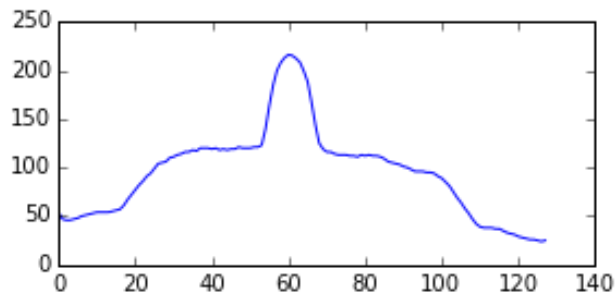
- Setting up for debugger
- Speed sensing/velocity control
- Velocity control detail
- Feedback control overview
- Bicycle steering model

TSL 1401 line sensor NATCAR 8 bit

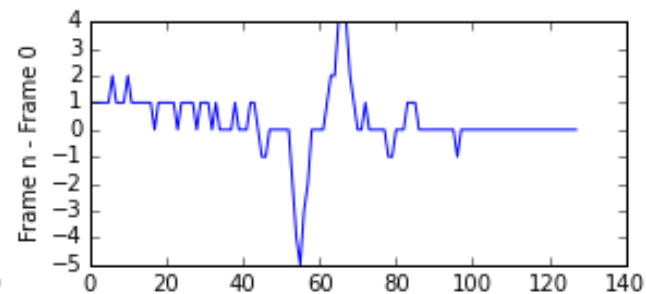
Frame 0



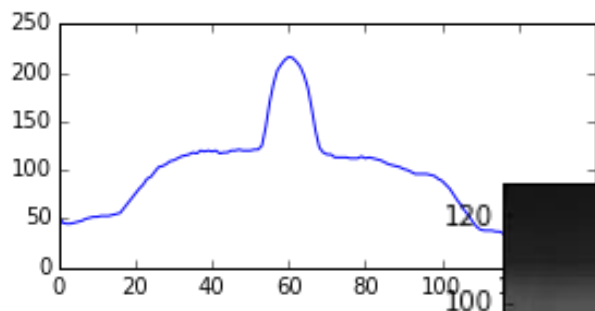
Frame 1



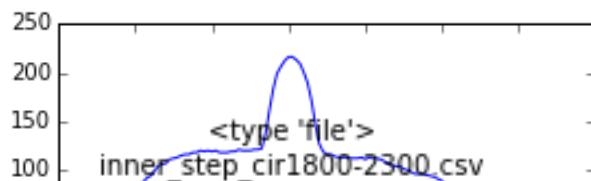
Frame 1-Frame 0



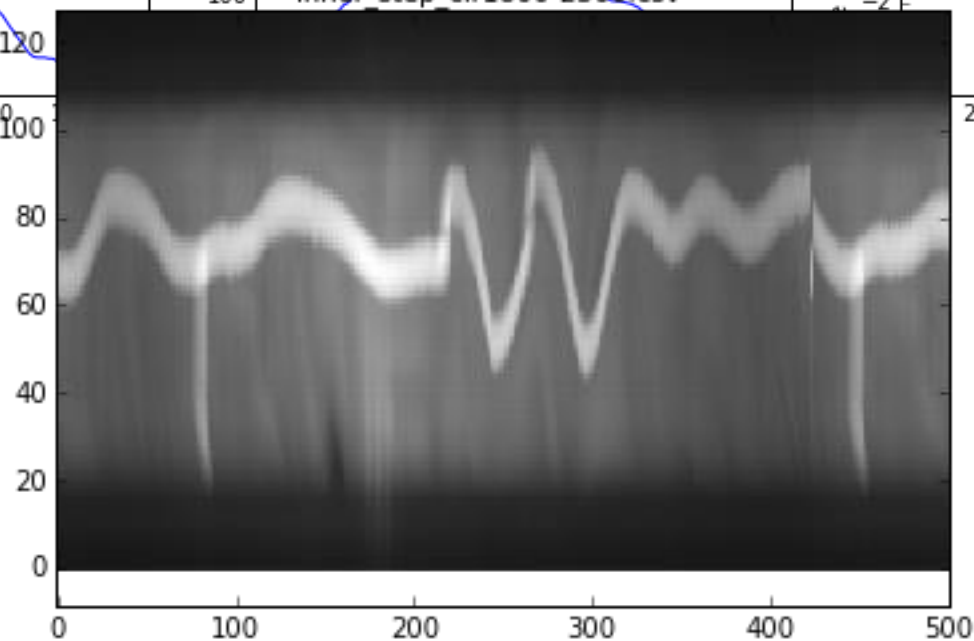
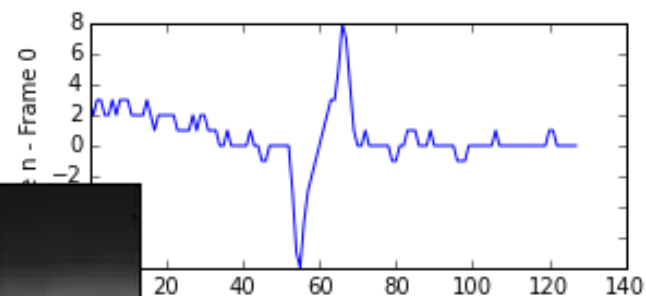
Frame 0



Frame 2



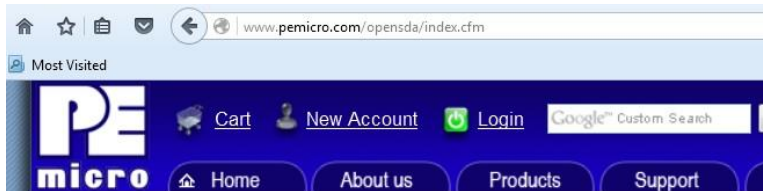
Frame 2-Frame 0



Lab Hygiene



Setting up for debugger: see new directions on Piazza



OpenSDA Support

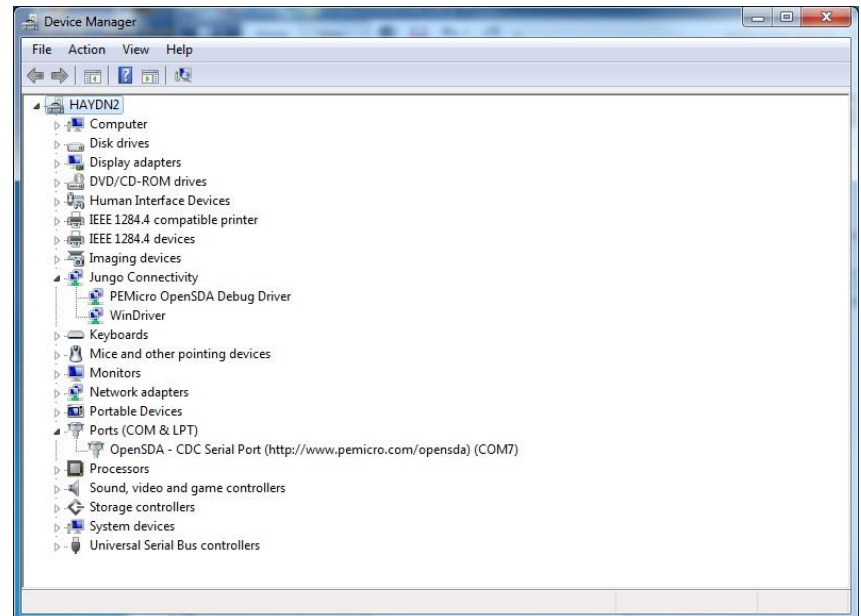
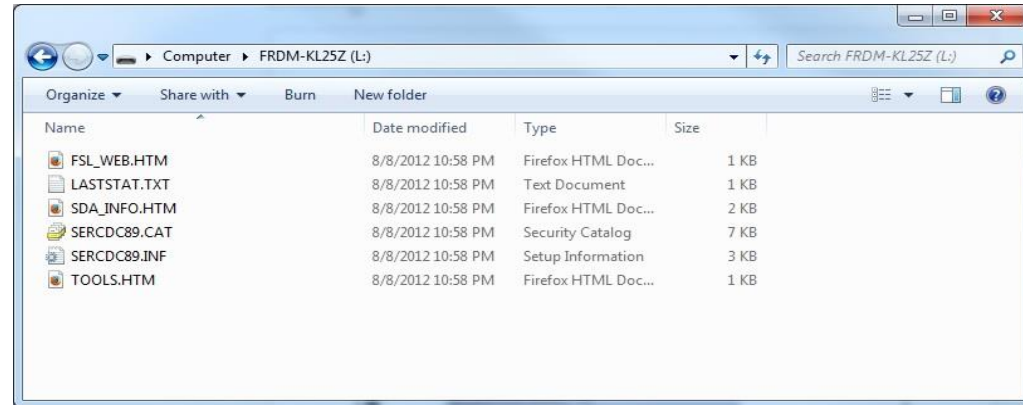
P&E provides the latest drivers, applications, and firmware updates for NXP's OpenSDA debug/programming interface.

Your Hardware Information

Board Name is: FRDM-KL25Z
MicroBoot Kernel Version is: 1.05
Bootloader Version is: 1.11
Installed Application: PEmicro FRDM-KL25Z Mass Storage/Debug App
Application Version is: 1.18
DUID is: CAE33938-958281B2-37500804-B860E678
EUID is: D481A239-17E8871C-1850EA1F-925968D6
TUID is: 74823938-473281F2-3761980F-B85CE678
TOA is: 86B6E505-8B3D9125-41E6B687-0CE8B90E
TOA2 is: 86B6E505-92A7B6F1-CDE430D7-9BC8AA5C
SUID is: 86B6E505-6C47A61D-37239804-8003EC65

[Register your board](#)

demo

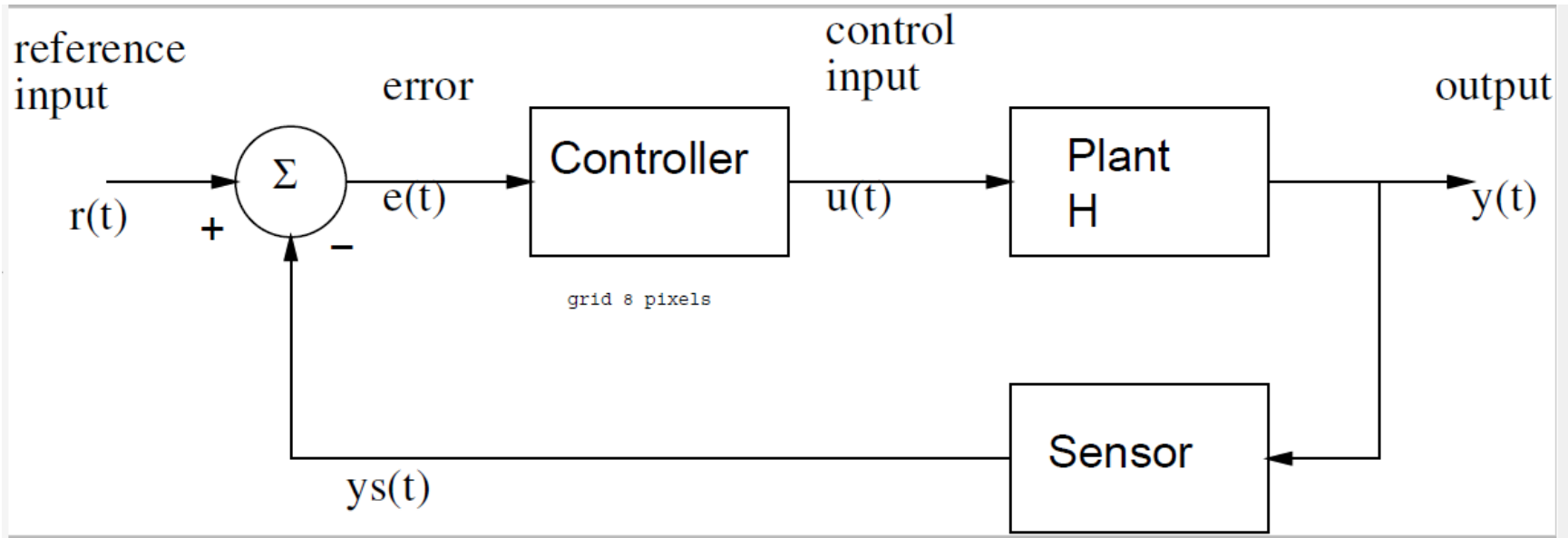


Velocity sensing (recap)

$V \sim (\text{change in angle}) / (\text{change in time})$

On board...

Control overview



On board...

Proportional control:

$$U = k_p * e = k_p * (r - y);$$

Proportional + integral control

$$U = k_p * e + k_i * e_sum;$$

$$e_sum = e_sum + e;$$