

EECS192 Lecture 8

Mar. 8, 2016

Notes:

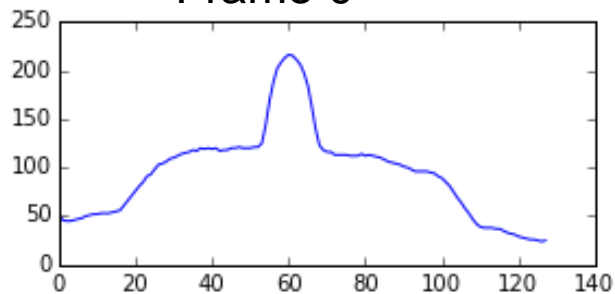
1. Check off-
 1. 3/11/2016: drop-and-run, velocity control, open loop fig 8
 2. Closed loop figure 8 drop and run
2. Community Spirit: PCB peer review, Piazza, helping fellow students
3. CalDay Sat. April 16 @ UCB, Freescale Cup at UC Davis
4. Parts orders: Digikey only. Check out ACE hardware for other parts. Order own parts Sparkfun, Adafruit...
5. Line sensor processing HW1 due 3/15 – upload iPython notebook to bcourses. (Will run on other data.)
6. Waterfall plot for line data
7. Lab safety/hygiene

Topics

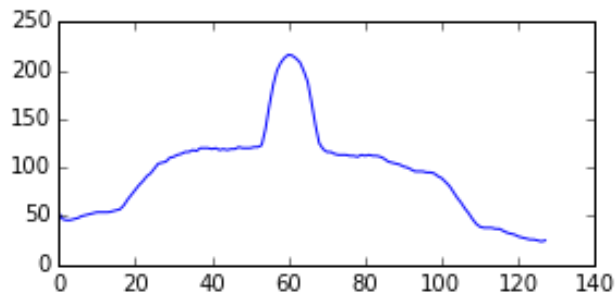
- Setting up for debugger
- Speed sensing/velocity control
- Velocity control detail
- Feedback control overview
- Bicycle steering model

TSL 1401 line sensor NATCAR 8 bit

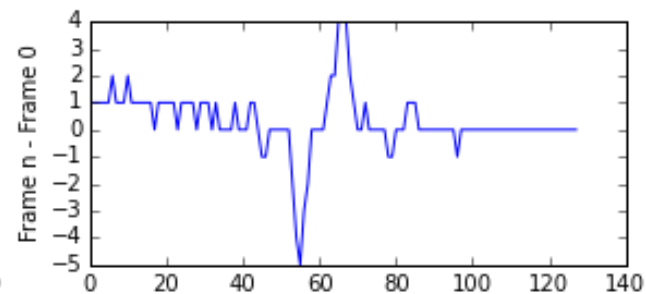
Frame 0



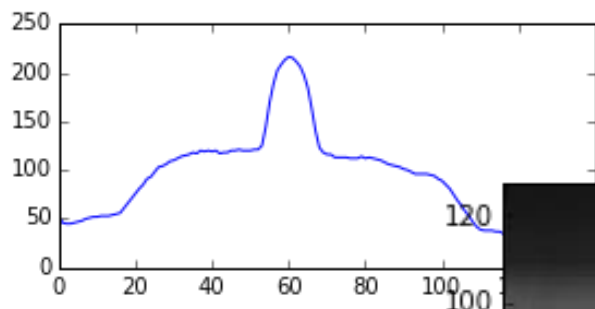
Frame 1



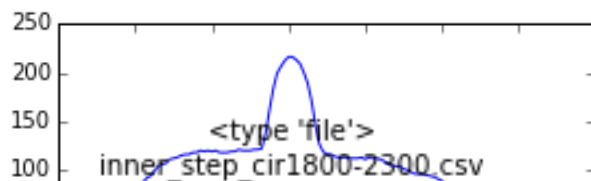
Frame 1-Frame 0



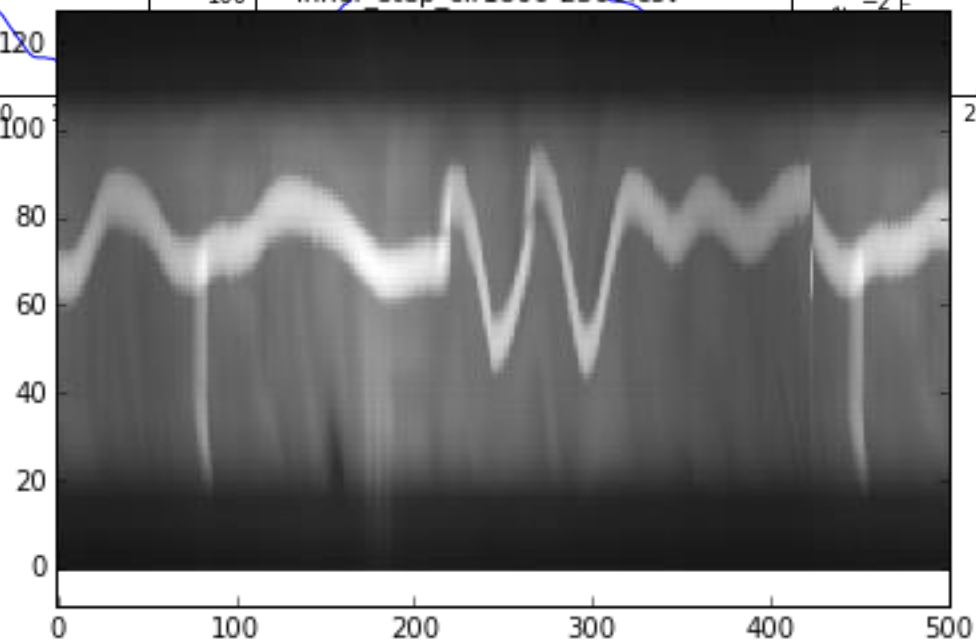
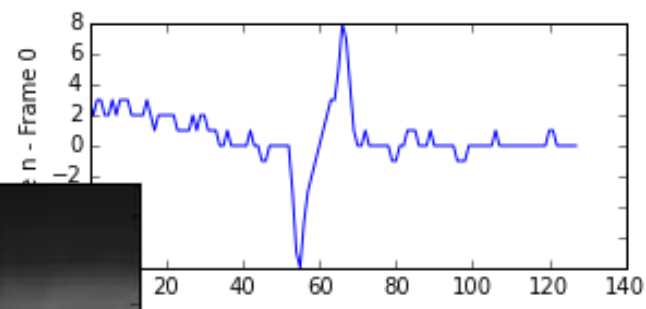
Frame 0



Frame 2



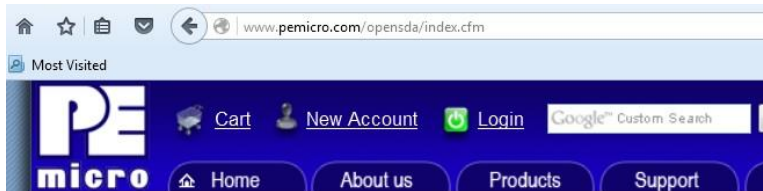
Frame 2-Frame 0



Lab Hygiene



Setting up for debugger: see new directions on Piazza



OpenSDA Support

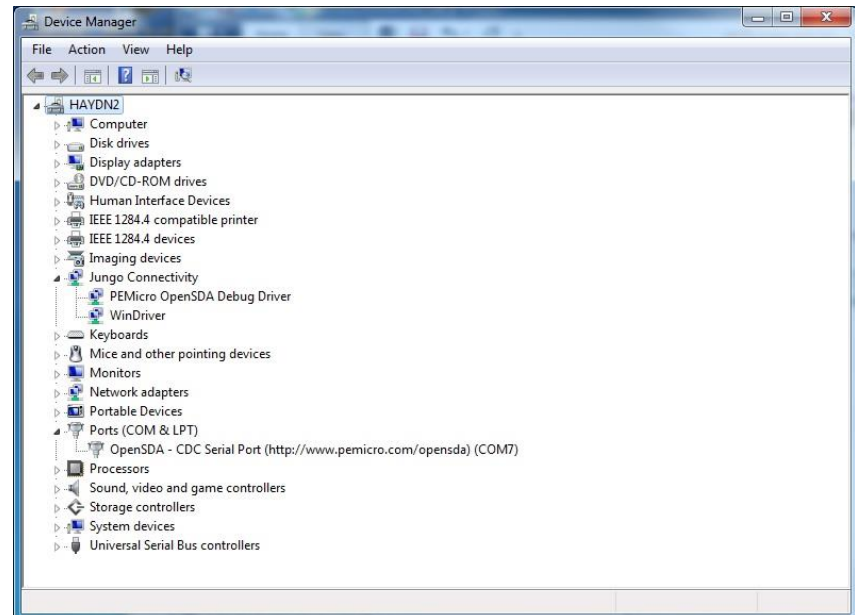
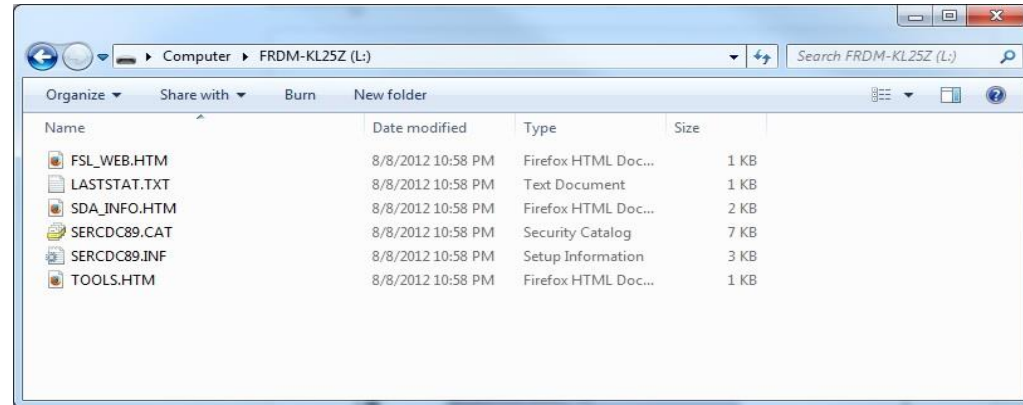
P&E provides the latest drivers, applications, and firmware updates for NXP's OpenSDA debug/programming interface.

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

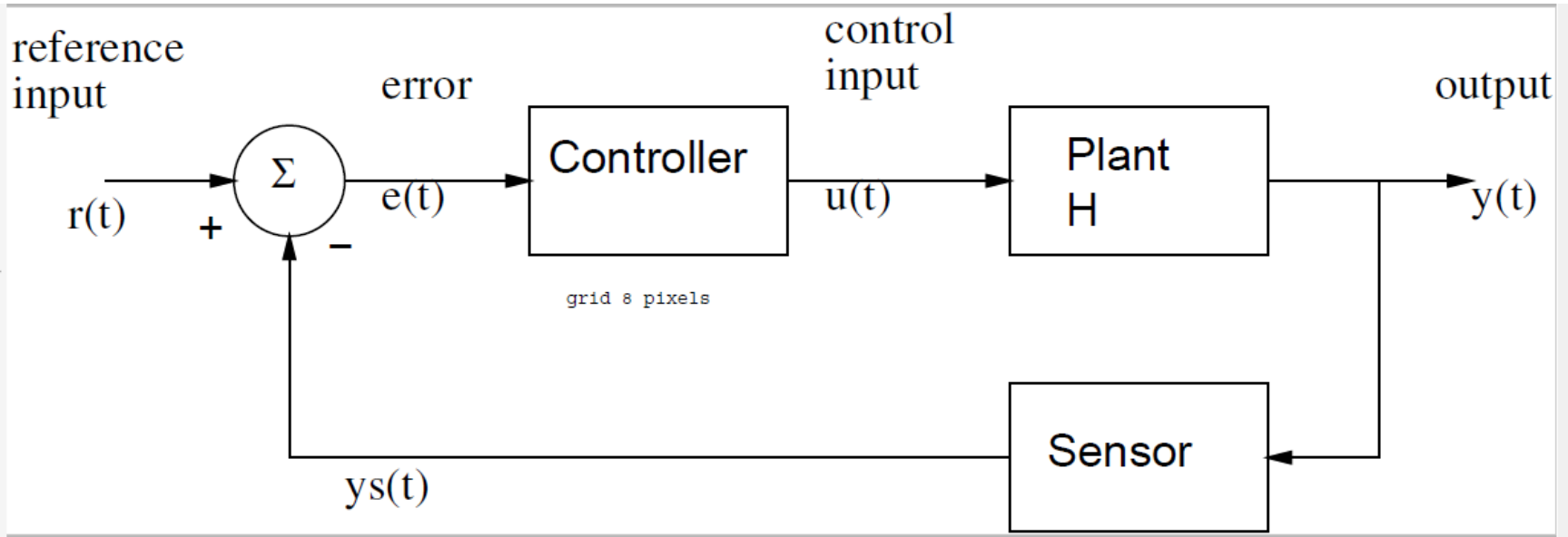


Velocity sensing (recap)

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

On board...

Control overview



On board...

Proportional control:

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

Proportional + integral control

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

$$e_sum = e_sum + e;$$