EE16B: Designing Information Devices and Systems II

Elad Alon, Babak Ayazifar, Gireeja Ranade, Claire Tomlin
Guest lecturer today: Jose Carmena

What Is This Class All About?

• You’ll be learning some of the most critical ideas and techniques used to design and make systems/products like these work!
EE16B Course Structure

- Organized in to modules
  - Lectures within each module closely tied in to labs

- Four key modules:
  - Brain-Machine Interfaces
  - Digital and Signal Processing Systems
  - Analog Front-Ends
  - Robotics

Module Content

- BMI:
  - Topics: Discrete Fourier Transform, Singular Value Decomposition/Principal Component Analysis
  - Lab: Decoding brain signals

- Digital Processing Systems:
  - Topics: what is digital, basics of logic and binary arithmetic, transient response (diff. eqns), power dissipation
  - Lab: ADC; minimized processor power

- Analog Front-Ends
  - Topics: sampling, aliasing, interpolation, filters (poles/zeros)
  - Lab: EEG front-end

- Robotics
  - Topics: control via eigenvalue placement, DC motors, inductors, 2nd order ODE
  - Lab: Final project!
Instructors & Key Contributors

Elad Alon  Babak Ayazifar  Claire Tomlin  Gireeja Ranade

Jose Carmena  Tsu-Jae King Liu  Vivek Subramanian

Instructor Office Hours

• Elad Alon
  – Tues. 2-3pm, Thurs. 1:30-2:30pm, 519 Cory (starting next week)

• Babak Ayazifar
  – TBA

• Claire Tomlin
  – Tues. 1-2pm, Wed. 11am-12pm, 721 Sutardja-Dai Hall
GSIs and Readers

**GSIs**
- **Ben Keller**
  - Office hours: TBA
- **Nathan Mailoa**
  - Office hours: Wed. 3-4pm
- **Emily Naviasky**
  - Office hours: TBA
- **Saavan Patel**
  - Office hours: TBA
- (Note GSI office hours begin next week)

**Readers and Lab Assistants (so far)**
- Scout Heid, Andrew Blatner, Aravind Kumaraguru

Class Websites

- Will be using piazza as main means of communication
  - Be sure to enroll!
  - https://piazza.com/class/idq5f7j9a596kf

- Course website: inst.eecs.berkeley.edu
  - http://inst.eecs.berkeley.edu/~ee16b
Discussions

- Two discussion session groups
  - Fri/Mon
  - Wed/Thurs

- You should attend one discussion from each of the two groups
  - But doesn't have to be what you signed up for online

Labs

- All held in 140 Cory

- Rotation: Thurs., Fri., Mon.

- Stick to the one you signed up for

- Check-offs will happen at the end of the lab session

- Labs begin Thurs. Sept. 3rd
Workload

- **10 (+ 1) homeworks**
  - HW0 will be posted today, but will not count towards your final grade

- **3 multi-part labs**

- **1 multi-part project**

- **2 midterms**
  - Midterm 1: Thurs. Sept. 24th, in class
  - Midterm 2: Thurs. Nov. 19th, in class

- **Final exam**
  - Wed. Dec 16th, 8-11am

Grading Policy

- **Homeworks:** 10%
- **Labs:** 10%
- **Project:** 20%
- **Midterms:** 30%
- **Final:** 30%
Homework Procedures

• Homeworks will be handed out on Thurs., due the following Thurs. at 5pm
  – Drop-off box in Cory; electronic submission accepted/encouraged
  – If we notice drop in Thurs. lecture attendance, we will shift the deadline to 8am

• Homework “party” will be held Mondays 6-8pm
  – Strongly encourage you to attend and get started in advance
  – Next week: 531 Cory
    • Elad will attend homework party to answer 16A review questions
  – Thereafter: 540A/B Cory

Homework Procedures

• We will use “self-grading” for the homeworks
  – Effective way to make sure you look at the solutions!
  – Solutions and rubric will be handed out Thurs. 5pm
  – You will submit your self-grades by Mon. 6pm
  – Readers will check your grading
  – Don’t even think about cheating...
**Reminder**

• This will be a very challenging class, and we will be covering a lot of ground
  – We have carefully selected which topics to cover and how to cover them
  – But everything we cover will be done in a rigorous and deep fashion

• If you really learn the material, you can immediately apply it to many real-world problems
  – How many of you had internships this summer?

• **Buckle up and enjoy the ride!**