Instructor: Prof. Clark T.-C. Nguyen

- Education: Ph.D., University of California at Berkeley, 1994
- 1995: joined the faculty of the Dept. of EECS at the University of Michigan
- 2006: (came back) joined the faculty of the Dept. of EECS at UC Berkeley
- Research: exactly the topic of this course, with a heavy emphasis on vibrating RF MEMS
- Teaching: (at the UofM) mainly transistor circuit & physics; (UC Berkeley) 140/240A, 143, 243, 245, 247B/ME218
- 2001: founded Discera, the first company to commercialize vibrating RF MEMS technology
- Mid-2002 to 2005: DARPA MEMS program manager
  - ran 10 different MEMS-based programs
  - topics: power generation, chip-scale atomic clock, gas analyzers, nuclear power sources, navigation-grade gyro, on-chip cooling, micro environmental control

Course Overview

- Goals of the course:
  - Accessible to a broad audience (minimal prerequisites)
  - Design emphasis
    - Exposure to the techniques useful in analytical design of structures, transducers, and process flows
  - Perspective on MEMS research and commercialization circa 2020
- Related courses at UC Berkeley:
  - EE 143: Microfabrication Technology
  - EE 147/247A: Introduction to MEMS
  - ME 119: Introduction to MEMS (mainly fabrication)
  - BioEng 121: Introduction to Micro and Nano Biotechnology and BioMEMS
- Assumed background for EE C247B/ME C218:
  - graduate standing in engineering or physical/bio sciences
  - knowledge of microfabrication technology

Course Overview

- The mechanics of the course are summarized in the course handouts, described in lecture today
  - Course Information Sheet
  - Course description
  - Course mechanics
  - Textbooks
  - Grading policy
  - Syllabus
    - Lecture by lecture timeline w/ associated reading sections
    - Midterm Exam: Thursday, March 19
    - Final Exam: Wednesday, May 13, 11:30 a.m.-2:30 p.m. (Group 10)
    - Project due date TBD (but near semester's end)
What Should You Know?

- Basic circuit analysis & design using op amps

Example: Find the transfer function $v_o(s)/v_i(s)$ of the circuit below.

$$\frac{v_o(s)}{v_i(s)} = \frac{A_v}{1 + A_v r_f}$$