EEL 6935: ANALOG SIGNAL PROCESSING
FALL 2002

Instructor: John G. Harris
Office: NEB 453
Phone: (352) 392-2652
Email: harris@cnel.ufl.edu
Homepage: http://www.cnel.ufl.edu/hybrid/harris.html
Office hours: MTW 2-3pm

TA: Xin Qi
Office: Larsen 139
Phone: N/A
Email: xinqi@cnel.ufl.edu
Homepage: http://www.cnel.ufl.edu/~xinqi
Office hours: TBA

Prerequisite: Basic courses in electronics and signals & systems
Class Meeting: MWF 6th period (12:50-1:40am) in EB 201
Class Homepage: http://www.cnel.ufl.edu/hybrid/courses/EEL6935


Recommended Books:


Course Overview: Biological sensory processing systems are used to motivate the development of analog circuit models of information processing in the brain. Subthreshold CMOS circuit designs are considered in detail for the design of vision, auditory and neural processing systems. Besides modelling neurobiology, such hardware can also lead to economical commercial products since real-world signal processing systems must interface with
the fundamentally analog world. There is much that can be done in the continuous-time analog realm before conversion to the digital domain. A key theme throughout the course will be the surprisingly ubiquitous role of digital pulses for signal representation and communication in both neurobiology and engineering systems. System examples include silicon and biological neurons, auditory system modelling, CMOS imagers and sigma-delta converters.

Course Topics:

- Below- and above-threshold MOSFET characteristics, noise and offset considerations.
- Basic computational building blocks (voltage- and current-mode)
- Physics of computation, ultra-low power processing
- Adaptive systems and floating-gate circuits
- Silicon/biological neurons, signal representation and computation
- Auditory system modelling (preprocessing, feature extraction and recognition)
- Visual system (state-of-the-art CMOS imagers, integrated visual processing chips)
- Interfaces to the digital world, sigma-delta converters

Tentative Grade Determination:
30% Homework
20% Exam 1
20% Exam 2
30% Final project

Key Dates:
October 2, period E1-E2, room TBA.
November 6, period E1-E2, room TBA.
Final project due Dec 11, 5pm.