**EEL 4930 - Smart Sensors - Fall 2014**

Course Syllabus: Students use smart phones to prototype sensor/actuator based Apps. You will use a high level user-friendly language (Processing).

Text: Rapid Android Development: Build Rich, Sensor-Based Applications with Processing, Daniel Sauter, The Pragmatic Bookshelf, 2013, ISBN-13: 978-1-03778-506-2

Reference (and Text book for the computer engineering and computer science group): Android for Programmers - An App-Driven Approach by Paul Deitel et al., Prentice Hall, 2nd edition, ISBN-10: 0133570924, Jan 2014

Pre-requisite: A course in programming. Background in instrumentation and digital signal processing is useful.

Co-requisite: ED1 (Engineering Design 1); cannot take if you are enrolled in ED2 (Engineering Design 2).

Instructor: Ravi Shankar, Professor and Director, CSI, CEECS

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Office Hours: 9 AM to 3 PM Friday

Course Time and Place: MWF 2 to 2.50 PM, EE 207 for MW. Note: Friday’s class will be on-line through Blackboard.

Course Description: This course is designed to help students develop and prototype Android-based mobile applications. Processing and the Nexus 7 Tablet are used in designing and prototyping. The current semester’s focus is on sensor and actuator integration in Apps. Apps may be information gathering, game oriented, and/or analytical for decision making. Note: This class will run concurrent to an undergrad course for computer engineering and science majors. Though both will get exposed to two programming languages and algorithmic/analytical techniques, the EE students will focus more on the Processing language, analog and digital signal processing, and mathematical aspects in their App development. App development will be a collaborative effort between the two groups. (The CS and CE students will focus on Java and web aspects of App development).

SDK kit and emulation will be used initially in the course. Nexus 7 tablets supporting Android 4.3 are available for app development

Grading: 3 class/take home quizzes 30% (on sensor data analysis for parameter estimation, image recognition, and Control); 2 Exams 10% (7th week) and 10% (finals week); 1Team (2 member) presentation - book Apps 20%; Study and prototype a Museum App 20%; and Document and 10%

The project in this course will count towards one elective lab experiment in EEL 4119L (Lab 2).

Topics to cover:

1. Android Introduction: High level Android Overview; Installing the SDK and other Plug-ins (Processing environment)
2. Installation: Processing 2, Android 4.x, Ketai Sensor Library, Nexus 7
3. Touch Screen, Motion and Position Sensors - Chapters 1-3/Text
4. Camera and Location Devices - Chapters 4 and 5/Text
5. Working with Data - SQLite - Chapters 9 and 10/Text
6. Android Accessories and Interfacing to Arduino via USB and Bluetooth