



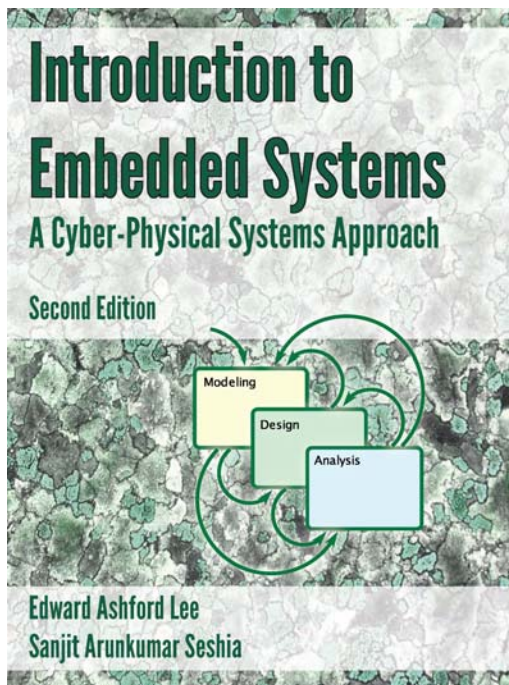
Introduction to Embedded Systems

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UC Berkeley
EECS 149
Fall 2015

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Lecture 0: Course Introduction and Logistics



Your textbook, written for this course, strives to identify and introduce the *durable intellectual ideas* of embedded systems as a technology and as a subject of study. The emphasis is on modeling, design, and analysis of cyber-physical systems, which integrate computing, networking, and physical processes.

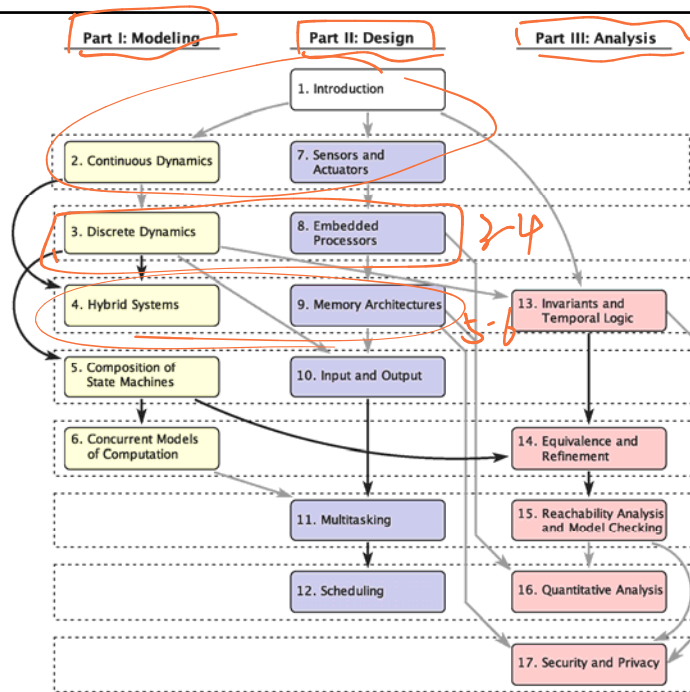
Use the Second Edition!

<http://LeeSeshia.org/>

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Book Map

The three threads are designed to be read concurrently and fit nicely within a 15-week semester.



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<http://chess.eecs.berkeley.edu/eecs149/>



The website is your key source of information.

Check it often!

First homework assignment

EECS 149

EECS 149/249A Lectures (subject to change)

Lecture	Date	Topic	Deliverable(s)
0	8/28	Cyber-Physical Systems and Introduction to the Course (ASV)	
1a	9/2	Sensors and Actuators (EAL)	
1b	9/4	Memory Architectures (EAL)	
2a	9/9	Interfacing to Sensors and Actuators (EAL)	
2b	9/11	Interrupts (EAL)	HW 1 due
3a	9/16	Model-Based Design (ASV)	
3b	9/18	Modeling Modal Behavior (ASV)	
4a	9/23	Extended and Timed Automata (ASV)	
4b	9/25	Composition of State Machines (ASV)	HW 2 due
5a	9/30	Hierarchical State Machines (EAL)	
5b	10/2	Multitasking (EAL)	

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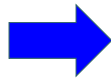
Labs: Hill-Climbing Robot – First 6 Weeks



New this year: Cal Climber → Cal *Klimber*



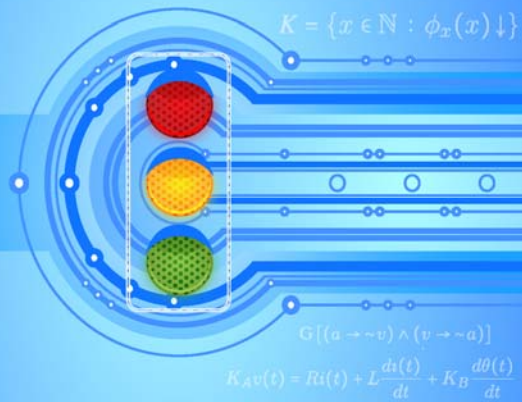
iRobot Create



Kobuki

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AN INTRODUCTORY LAB IN EMBEDDED AND CYBER-PHYSICAL SYSTEMS



Jeff Cameron Jensen
Edward Ashford Lee
Sanjit Arunkumar Seshia

The Lab Manual is a work in progress. *Please help us make it better by offering constructive suggestions and correction.*

Download package including lab manual and documents it links to from:

<http://LeeSeshia.org/lab>

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VERY IMPORTANT: (Re)Sign up for Lab Sections

Read the Course Announcement sent out by GSIs via
bCourses

Meet me after class if you do NOT have access to
bCourses for any reason

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Course Project

An important component of the course

We will give you topics because of the large number of enrolled students.

Under special circumstances, we may accept projects proposed by students, but only if they are highly innovative. Be careful, many proposals we got in the past were HARD to achieve in the time allotted.

See past projects on the course website.

- Project highlights video:
<https://www.youtube.com/watch?v=CqK6ttxtWc>

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Some Previous Projects



Biomimimetics



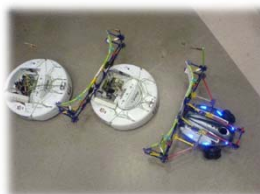
Face Tracking



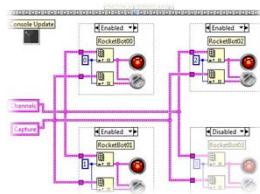
Autonomous Flight



Distributed Music



Robot Train



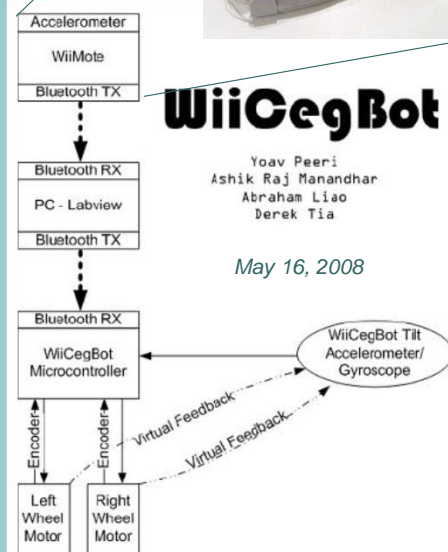
Robot Swarm

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Example Project:



One of the five project teams in 2008 developed a balancing robot inspired by the Segway. They used a Nintendo Wiimote as a controller communicating with a PC running LabVIEW, communicating with a Lego Mindstorm NXT, which they programmed in C.



Project for 2015...? ☺

