CS100R:
Introduction to Computing Using MATLAB and Robotics

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http://cs100r.cs.cornell.edu

Cornell University
Computer Science

Overview

- What is CS100R?
  - An honors-level intro to CS using camera-controlled robots (Sony Aibo, iRobot Create)
  - An alternative to CS100M or CS101M, to fulfill your Matlab computing requirement
- Requirements:
  - Exposure to programming (in any language)
  - Some interest in math
    - Computer science is about much more than programming, and so is CS100R

CS100 AND CS101

Beginning Fall 2007: every engineering student takes CS100 (4 credits) and CS101 (1 credit)

CS100M or CS100R. Then CS101J.

Malab, then Java

or

CS100J or CS100H. Then CS101M.

Java, then Matlab.

CS211 prerequisite: CS100J or CS101J.

CS100J:
Intro to Computing using Java

Prof. David Gries

http://www.cs.cornell.edu/courses/cs100j/2007fa/

No previous programming experience required.

No calculus required.

Course outcomes: A basic understanding of object-oriented and procedural aspects of programming, as expressed in Java.

Fluency in writing Java programs.

CS101J Transition to object-oriented programming

Starts this fall. Will be given every semester.

Self-paced, 4-week, course, relying on blectures (web lectures, like blogs are web logs). Can do it in shorter time, if you want. Take a look at course website:

http://courses.cit.cornell.edu/cs101j/

CS101M, about Matlab, will start in the spring. It also is a self-paced 4-week course.

CS100M:
Intro to Computing using Matlab

Prof. Fan & Prof. Van Loan

http://www.cs.cornell.edu/courses/cs100m/2007fa/

No previous programming experience required.

No calculus required.

Course outcomes: A basic understanding of programming and problem solving using Matlab.

Fluency in writing Matlab programs.

CS100R robots (not to scale)

Sony AIBO

iRobot Create

Robots: cute but dumb

- What do they know about the world around them?
  - Without your help, very little
  - Can't even notice a bright red lightstick
- Your mission: make them smarter
- This involves a lot of very interesting math and computer science, and a certain amount of computer programming
  - Lots of experience with programming, even with robots, won't give you a leg up in 100R

CS100R Logistics

- Lectures: Tue Thu 11:15–12:05, UP 315
- Sections:
  - Mon Wed 2:30–3:20, UP 317
  - Mon Wed 11:15-12:05, UP 317
  - There might be one other section
    - We'll try to make it easy for you to attend
  - Please go to same section for the entire course
- CS100R probably only offered in Fall

Assignments

- Approximately one mini-quiz per week
  - In class, usually at start of Thursday lecture
    - Corollary: be on time, or write fast…
- 4 large robot programming assignments with multiple parts
  - You will demo each part to the lab TA's
- 2 or 3 prelims, probably in-class
- Free-form final project (required)

Major CS100R Projects

- From a camera, figure out the position of a bright red lightstick
  - Use this to guide a robot around
- Build a robot speedometer/accelerometer
- Distinguish a red object from a blue one
  - Train robots to distinguish Coke vs. Pepsi cans
- Track a robot from an overhead camera
  - Guide it through a maze
- Do Something Cool (final project)