Class Goals

At the end of this class you will have an understanding of the current state of the art in autonomous robotics and will be able to contribute to original research conducted in our lab.

Class Goals (2)

• You will know how to program robots using the Robotics Operating System framework (C++ and python)
• You will have completed a small project of your choosing – something you can brag about at job interviews
• You will be qualified for an internship at one of the many robotics companies in town

Overview of the Class

• Quick Intro
• Syllabus
• Class Goals
• Policies and Procedures

Class Web Page

http://www.cs.tufts.edu/comp/50AIR/

Topics to be Covered

• Introduction to robotics
• Robot Operating System (ROS)
• Robot Control
• Autonomous Navigation and Localization
• 2D and 3D Computer Vision
• Computational Perception
• Human-Robot Interaction
• Developmental Robotics
Organization*
This class will be taught as a seminar. The students will be expected to read the assigned papers for each lecture in advance and to actively participate in class discussions.

* The instructor reserves the right to change any and all aspects of this class for whatever reason or no reason at all (i.e., academic freedom).

** You agree that I have the unconditional right to exercise discretion in a way that is most favorable or convenient to me.

Prerequisites
Programming skills will be required for the homework assignments and for the final project. The most important prerequisite of all, however, is your interest in the course, motivation, and commitment to learning.
Prerequisites

A strong interest in the question, "What is intelligence and how can it be implemented in a physical robot?"

For best results take two lectures weekly. Common side effects may include sleepless nights, broken robots, nervousness, and banging head on keyboard. Frequent visits to the mentors and the TA have been shown to alleviate some of those symptoms. Talk to your instructor if this class is right for you.

Final Project

The final project must be a research or design project that is related to the topics covered in class. You may choose to work individually or in small groups (2-3 members each). Working in groups, however, is highly recommended. You are encouraged to select a topic for your final project as soon as possible.

Project Components:
- Project Proposal
- Final Report + Deliverables
- Project Video / Presentation

Homework Assignments

There will be two types of assignments:

1) Weekly responses to readings on Trunk

2) Programming Assignments (weekly or bi-weekly)

Policy on Collaboration

You are encouraged to form study groups and discuss the reading materials assigned for this class. You are allowed to discuss the homework assignments with your colleagues. However, each student will be expected to write his own solutions/code. Sharing of code is not allowed.

Reading Responses

IMPORTANT

- Cheating, plagiarism, and other academic misconducts will not be tolerated and will be handled according to Tufts' academic dishonesty procedures. The rules require me to report any perceived evidence of dishonesty
Attendance

You are expected to attend every class and actively participate in the discussions. If you miss a class, it is your responsibility to find out what we talked about, including any announcements.

Programming Languages

• C and/or C++
• Python

Grading

Your grade will be determined as follows:

• Class Participation: 10%
• Reading Responses: 10%
• Homework Assignments: 50%
• Final Project: 30%

About you

How Difficult is this Class?
My robot friends...

Robots in Industry

Mobile Robots

What is a robot?

("Service" Robots

(class discussion)
“What is intelligence and how can we implement it in a physical robot?”

Breakout (10 + 10 min)

• Gather in a small group with those around you and introduce yourself
• Discuss a few questions (on next slide) – take notes so that you can recall what you talked about
• 10 minutes for the small group discussion followed by 10 minutes for the whole class discussion

Breakout (10 + 10 min)

• What does it mean for a robot to be intelligent?
• What are some of the things that an intelligent robot should be able to do?
• Can a robot do more than just what it is programmed to do by human experts? What does it mean to program intelligence into a robot?
Readings for Next Week

- Reading Response due Monday 1/29
- A forum of Reading Response 1 will appear on Trunk tonight

Getting Started / Homework 1

- Get set up with a ROS environment
- 3 Options:
  - Dual boot a computer you own (Ubuntu 14.04 LTS + ROS Indigo)
  - Set up a virtual machine on a computer you own
  - Sign up @ ROS Development Studio
How to start turtlesim

1. In one terminal, run:
   $ roscore
2. In another terminal run:
   $ rosrun turtlesim turtlesim_node
3. If using the web-based ROS development studio, skip step 1.

Homework 1 Due: Friday 1/26

• An assignment will appear on Trunk tonight