Course Objectives and Scope

Introduction to vision-based navigation for robotic vehicles

Second quarter in a two-quarter sequence

- Winter: Vision, state estimation, and mapping
- Spring: Motion planning, navigation, and control

Problem sets, programming assignments, week-long mini-projects, and a month-long project
Instructors

Lectures by JPL personnel with general support from Prof. Joel Burdick

http://robotics.jpl.nasa.gov/people/... for more info

Larry Matthies  Adnan Ansar  Roland Brokkers  Yang Cheng  Tom Howard
Nick Hudson  Yoshi Kuwata  Jeremy Ma  Brian Williams  Joel Burdick

TAs, Logistics

Lectures: Tue/Thu, 2:30-4pm, 306 Thomas
Office Hours: Tue/Thu, 4-5pm, 303 Thomas
TAs: Andrea Censi, Shuo Han (me132-tas@caltech.edu)
Mailing List: me132-students@caltech.edu
Text (Spring Quarter): S. LaValle, Planning Algorithms (http://planning.cs.uiuc.edu)
Website: www.its.caltech.edu/~me132
why study motion planning?
Spring quarter goals
applications

research

Image: RedTeamRacing.com

Image: [Howard 09a]
Spring quarter lectures

Kinematics and Dynamic Models
March 29 - March 31

Search Spaces
April 5

Image: [Howard 09a]
Costing
April 7

Search Algorithms
April 12-14

Navigation and Control
April 19

Case Studies
(Motion Planning)
April 21
**Mini-Project/Lab**
**April 26-28**

**Case Studies**
(Autonomous Systems)
**May 3-5**

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**Homework**

Once a week (Thursdays)
Due in one week
Assignments include readings, problem sets, coding
TBD grace period days
Free to use any programming language for assignments

NEW Include # of hours spent on assignment
Mini-Project (Apr 26-28)

Focus on aspects of motion planning and navigation

Goal is to port ideas from homework to a real system (Pioneer)

No grace period days

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Project (May 3-26)

Extend ideas presented in class in your area of interest (perception, estimation, mapping, motion planning, navigation, etc.)

Present last week of class (5/24-5/26)

More details in the coming weeks
Next

Lecture 1: Kinematic and dynamic models (3/29)
   Homework #0 Read LaValle Chapter 1 (pages 4-26)
Lecture 2: Motion simulation (3/31)
   Homework #1 Assigned

questions, concerns, etc.
Document/Image References
