CS148 - Building Intelligent Robots
Advanced Track Class Project

Instructor: Chad Jenkins (cjenkins)
Getting started

• Meet with me to discuss potential projects
  – we should have met by 10/14
  – it would help me to know your interests ahead of time

• Project ideas
  – autonomous control projects
    • articulated robot control (e.g., humanoids, Puma arm)
    • groups of simpler robots (e.g., robocup, SLAM)
    • learning approaches (e.g., learning robot tasks or skills)
    • implementation of a paper
  – robot construction
  – new sensors and sensor data processing
    • time of flight, etc.
Advanced track milestones

- 10/14: Completion of labs
- 10/21: Project proposal
- 11/2: Peer-reviewing and project workshop
- 11/18: Prototype
- 12/7: Final demonstration
- 12/9: Final paper
Project proposals

• Format
  – ICRA conference
    • http://www.icra2005.org
  – 4 sections

• Objectives
  – goals for the project
  – scope for implementation
  – or scope for a survey paper

• Approach
  – design/architecture methodology
  – technical implementation plan (details)

• Discussion
  – related work
    • papers, websites, projects
  – challenges and potential problems
  – outline for alternatives
    • Plan B, C, ...

• Evaluation
  – how will you validate your implementation

• Multiple people can collaborate on a project
Project peer-reviewing

• Each student will review two project proposals other than their own

• Review criteria
  – clarity of project objectives and approach
  – technically interesting problem
  – likely challenges and potential problems are addressed

• Review format
  – 1-2 pages (single column, single space, ascii)
  – summarize proposal, address criteria, provide suggestions
Project workshop

• 5-7 minute pitch for your project
  – additional 3-5 minutes for questions and comments

• 6 slides maximum

• The goal: get feedback from peers to improve your project

• Emphasize high-level objectives and interestingness
Implementation prototype

• In-class demonstration
  – open to questions and comments from class

• Prototype is a “proof-of-concept” that demonstrates the feasibility of the project

• Be prepared to state
  – progress made in implementation
  – remaining issues and features for implementation
Final presentation

• In-class demonstration and brief presentation
  – 5-7 slides, 10-15 minutes
  – open to questions, comments, and testing from class

• Final implementation is a working system that meets or exceeds reasonable expectations set in the proposal

• Be prepared to roughly state
  – features and robustness of the implementation
  – features not implemented and shortcomings of the approach
  – significant issues of large importance not addressed will result in score deduction
Final paper

• Format
  – ICRA conference format
  – 5 sections and a conclusion

• Introduction/Motivation
  – short summary of work
  – why the project is interesting

• Approach/Implementation
  – design/architecture methodology
  – technical details of implementation

• Discussion
  – related work
    • papers, websites, projects
  – challenges and problems addressed
  – strengths and shortcomings
  – potential extension

• Evaluation
  – how implementation was tested
  – how well did it perform

• Workload breakdown
  – clearly state individual contribution for collaborations