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
  - technially interesting problem
  - likely challenges and potential problems are addresses

- 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 preparted 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 preparted 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