CS 4649/7649
Robot Intelligence: Planning

Final Project Information Session

Sungmoon Joo

School of Interactive Computing
College of Computing
Georgia Institute of Technology

Final Project

- To expose students to research in planning
- Makes up 40% of the grade
- CS7649 Graduate Projects:
  - work in groups(max. 4) on a project that is relevant to their research goals.
  - students are welcome to expand on active projects in their own research labs.
  - final decisions on topics will be made through discussion with the instructor.
  - deliverables: proposal, final report(conference-style paper), final presentation

Final Project

- CS4649 Undegraduate Reviews:

- undergraduates take the role of reviewers for the projects*.
- once the topic selection/grouping is done, reviewers will be assigned to each project
- for the assigned project, reviewers will monitor the progress/research activities, and will be required to review the project proposal, final report & presentation
- in addition to the assigned project, reviews on the presentation of other projects are required(presentation review sheets will be provided).
- deliverables: proposal review report, final review report, final presentation reviews

(e.g. For a reviewer assigned to project A: proposal/final report/presentation reviews for project A + presentation reviews for the rest of the projects B,C,D…)

- will be graded based on the thoroughness of their reviews and understanding of the project topics

* given the option to participate in the projects directly and be graded as graduate students.

Deliverables Summary

CS7649

- **Project Proposal(2-3 page long)**
- **Project Final Report (conference-style paper)**
- **Presentation (10~15min, depends on total number of project teams)**

CS4649

- **Two options:**
  Case #1 Participating in a project.
  Case #2 Taking a reviewer role.
- **For case #1, same as CS7649**
- **For case #2:**
  (i) proposal review, (ii) final report review, → for the assigned project
  (iii) presentation reviews → for all presentations

- **Simulation of conference/journal paper writing**
- **Collected reviews will be delivered to the project members**

Suggested Timeline

• CS7649

- project topic decision, grouping: Due Oct. 23
- project proposal: Due Oct. 30, 2-3page (motivation, technical gap, approach, expected result)
- project final report: Due Dec. 4, 23:59pm, conference-style paper (format is on the course web)
- project presentation: Dec. 11, 11:30am - 2:20pm

*there may be meetings between project teams and the instructor to see if projects are progressing as scheduled.

• CS4649

- project reviewer assignment: Oct. 28
- proposal review report: Due Nov. 6
- project review report(for the assigned project): Due Dec. 11, 11:30am
- project presentation review*(for all presentation): Due Dec. 11, 2:20pm

*presentation review sheets will be provided

Review Report (proposal)

Proposal review report will answer the following questions (at least)

[1]What is the project about?

[2]Does the proposal describe motivation and overview of the work?

[3]Why is the work significant and worth a final project?

: Why do we care about the problem? What are the potential benefits from the work?

: What is the problem(technical gap) that needs to be solved?

[4] Is the proposed approach novel?

[5] Is the expected result feasible?

Review Report (final report)

Project final review report will answer the following questions (at least)

[1]What is the paper about?

[2]What about the work is original, novel, and unique?

[3]Why is the work significant and is this enough to warrant presentation?

[4]Does the work describe its underlying theoretical principles?

[5]Are these principles well explained and correctly applied?

[6]Does the paper provide compelling (experimental) evidence?

[7]Are the experiments/simulations well conceived, sufficient in scope, and statistically significant?

[8]Does the work contain adequate technical detail to confirm its correctness?

[9]Does the work report on what was learned?

[10]Is the presentation/final report logically organized?

Review Report (final report)

Project final review report will answer the following questions (at least)

[11]Is the presentation/writing understandable?

[12]Does the abstract succinctly summarize the main ideas and results of the work?

[13]Does the introduction provide motivation and overview of the work?

[14]Are figures informative and clear with proper labeling?

[15]Are the captions explanatory of the figure content?

[16]Does the summary/conclusion meaningfully describe the contribution and result?

[17]Are adequate citations made for prior work or controversial statement?

[18]Is the bibliography complete?

[19]Comments/suggestions to the authors?

[20]Comments to the instructor?

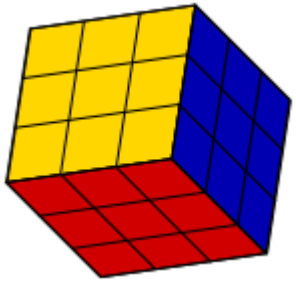
Planning applications

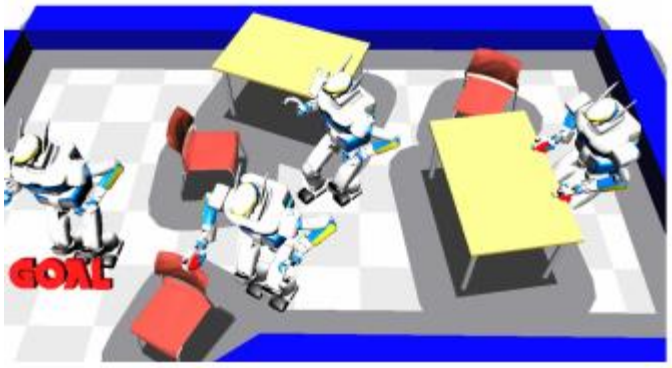
Planning is everywhere !!

Logistics

http://transportnalogistika.blog.com/

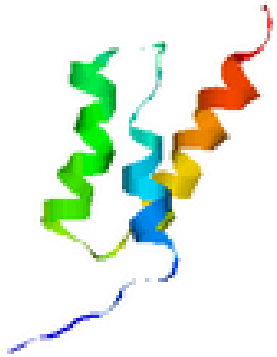
Games





Mike Stilman: NAMO

Andrew Y. Ng: Helicopter flying



N. Amato: Protein folding

Robot Task/Mission Planning, Motion Planning, Legged robot footstep planning, Controls, Navigation, Bio-medical applications…

Examples: IROS2014 papers

Some of the papers with keyword 'planning'

- *Motion Planning under Uncertainty for Medical Needle Steering Using Optimization in Belief Space*
- *Unifying Multi-Goal Path Planning for Autonomous Data Collection*
- *Coverage Planning with Finite Resources*
- *Coordination in Human-Robot Teams Using Mental Modeling and Plan Recognition*
- *A Probability-Based Path Planning Method Using Fuzzy Logic*
- *Multi-Goal Path Planning Based on the Generalized Traveling Salesman Problem with Neighborhoods*
- *Informed RRT*: Optimal Sampling-Based Path Planning Focused Via Direct Sampling of an Admissible Ellipsoidal Heuristic*
- *Integrating Multiple Soft Constraints for Planning Practical Paths*
- *Sampling-Based Trajectory Imitation in Constrained Environments Using Laplacian-RRT**
- *The Anatomy of a Distributed Motion Planning Roadmap*
- *A Framework for Formal Specification of Robotic Constraint-Based Tasks and Their Concurrent Execution with Online QoS Monitoring*
- *Reactive Switching Protocols for Multi-Robot High-Level Tasks*
- *A Compositional Approach to Stochastic Optimal Control with Co-Safe Temporal Logic Specifications*
- *A Constraint-Based Method for Solving Sequential Manipulation Planning Problems*