

University of Denver
COMP 4704-4
Introduction to Artificial Intelligence
Course Project Description

1. Project Proposal

Due April 23, 2014

Propose a project for the course. You are free to propose any project that interests you, but the project must be approved by the instructor. If you need this course to count towards the advanced programming requirement you must state this in your project proposal and choose a project which is heavily oriented towards programming.

The project proposal should describe in detail the work that you will perform for the project, including the work that will be finished by May 12 and what will be finished by June 3. First, establish a research-oriented question that you want to answer. This may take the form of a hypothesis which you are hoping to prove or disprove. For instance, "I hypothesize that I can build a strong Chinese Checkers program using machine learning." Then, describe the work that you will do, and how the work will be implemented. (eg "I will implement a Chinese Checkers program in C++ and use reinforcement learning to learn an evaluation function.") Describe how will you measure the results. What parts of project involve uncertainties that may take longer to implement or complete? Provide as much detail as possible. Set several milestones for when work will be completed.

Project suggestions are mentioned during lecture and some suggestions are on the second page of this document.

2. Project Status Report

Due May 12, 2014

This report should describe the work done so far, and any challenges faced. You should complete the work suggested in the project proposal, or clearly justify why that work couldn't be completed.

3. Final Project Report

Due June 3, 2014

Your final project report should write up your work in the style of a research paper, beginning with an abstract that briefly describes the project and results. An introduction should provide more details about the project, similar to what was covered in the proposal. Next, provide a section detailing any related work, and then cover any main theoretical and experimental results that you performed during your project.

If you haven't already, read several research papers in the field of AI to get a sense of how they are written. Look for papers that might have related work to your course project. **If you do an excellent job on the course project, there is the opportunity to further develop the work and submit it to a major AI conference.**

Suggested Projects

1. Look for programming assignments in the book and choose one as the basis for your project. Some assignments will need a larger scope to be acceptable as a course project.
2. Find an AI problem in research that you are already performing, and propose applying AI techniques to that problem.
3. The General-Game Playing competition is an annual competition where competitors write programs that can take a logic description of a game as input, and then play any deterministic single-player, two-player, or multi-player game. Write a GGP agent that can compete in the GGP competition. (The competition often has a \$10,000 prize for the winner.)
4. Write a program that is able to learn to play a game better than you can.
5. Write a program that can quickly find paths on a grid maps with changing weights (eg that change after each pathfinding request.)
6. Simulate an LRTA*-like agent that has limited sensing ability, and work to improve its performance.
7. Write your own CSP solver.
8. Use genetic algorithms or local search to solve a computationally difficult problem well.
9. Choose a project that you find interesting and challenging and propose it.