Course Project
CMSC671 – Fall 2001 – Prof. desJardins

1 Project Description

CMSC671 students will work in groups of two or three students to design, implement, demonstrate, evaluate, and report on a working AI system in Lisp that combines two significant components of the course.

The project will be developed over the course of the semester, with a series of milestones or "deliverables." The intention of these milestones is to keep you on schedule for completing the project in time, and to give you feedback on your plans.

Here are three suggested projects. You can select one of these, or develop your own project.

1. A backgammon or Othello playing system, with a reinforcement learning or neural network learning component.

2. An HTN planner with temporal reasoning.

3. A constraint-based scheduler with a natural-language interface or dependency-directed backtracking.

The objectives of the project are to have students:

- Understand how to structure the development and execution of a moderately large "research" project.

- Gain experience in formulating and scoping a project.

- Practice writing proposals and technical papers.

- Acquire in-depth knowledge about several AI techniques.

- Implement a working system in Lisp.

- Apply statistically sound experimental methodologies to evaluate their approach to solving a problem.

To give you time for the project, I have reduced the number of homework assignments from seven to six. The first three homework assignments have programming components. The remaining three homework assignments will be written only, and will not be as lengthy as the first assignments. I have also changed the first midterm exam to a shorter quiz, with the rest of the lecture being used to discuss the projects and/or catch up on lecture material.

2 Project Milestones

Milestone	**Due date**
Teams formed	9/25
Proposal due	10/2
Design document due	10/16
Initial working system	11/6
Draft final report	11/27
Final working system and demo	11/29
Final report	12/11

3 Proposal

A proposal describing your project is due in two weeks. This proposal should be a couple of pages long, and should describe:

- What your system will do.
- What AI techniques you plan to incorporate.
- How you will apply these techniques, and what features you will incorporate.
- The application domain for your system.
- Sources that you have identified to learn about these techniques (can include class readings as well as outside sources).
- What your experimental baseline will be.
- What experiments you will run to evaluate your system.

Depending on the specific details of the implementation, any of the projects listed above could be major research projects, "toy" projects completed in a weekend, or projects of appropriate scope for a term project for a graduate-level AI course (that's us). The purpose of this proposal is to identify your topic, and narrow the scope to an appropriate-sized project.

I fully expect that your projects will evolve as you study the techniques more and as you begin the design and implementation. If your project scope changes significantly as a result of the development process, you may submit a revised proposal to reflect these changes.

Not surprisingly, many of these projects involve techniques that will not be covered in the course until later in the semester. Hence, the source list. You will need to study ahead on the topics for your particular project.

Please feel free to stop by during office hours or set up a time to talk to Prof. desJardins or Suryakant about your ideas, or about the techniques you're planning to incorporate.

4 Design document

The project design document is due two weeks after the proposal. The design document should describe the representations and major modules you will develop to build your system. You should also include a rough schedule of tasks to be carried out. Don't forget to include tasks to write the reports, and to develop and carry out the experimental plan.

5 Initial working system

The initial working system is due two weeks after the design document, and should be submitted in three parts: a README file summarizing what files are included in the submission; a set of Lisp files; and one or more script files demonstrating the system's current capabilities. This script file should be *documented*, so that the course staff can understand what it is you're doing in the script.

6 Final working system and demo

The final working system is due at the end of November. You should also schedule a time to demonstrate your system to Suryakant and Prof. desJardins.

7 Final report

Each team will deliver a final report on the project. A draft of the final report is due before the working system is delivered. I will give you feedback on this final report within a week, which gives you another week to make any changes based on that feedback, or based on last-minute evaluations and changes to the system. The final report is due at the last class of the semester.

8 Grading and teamwork

Grading for the written and programming portions will be similar to the grading of homework assignments. In addition, your grade will depend on having an appropriate scope for the project, on the correct application of the AI techniques you use, and on the distribution of work within the team.

Each deliverable should be turned in as a team.

In addition, at the time each deliverable is due, each student should turn in a statement of work allocation. These statements should be prepared *independently*.

In the work allocation statement, if you feel that all students worked equally on all parts of the deliverable, say so. If you divided up the work by particular tasks, say so. If you feel that thpe workload was unequally distributed (whether in your favor or against), say so.

The goal is that students within a team should contribute equally to the project. How you determine what is an "equal contribution" is up to you. If for whatever reason, the contribution is unequal, then ideally there will be a consensus about this. However, if there are significant discrepancies among the work allocation statements within a team, I will work with the students to resolve those discrepancies and determine a fair grade allocation.