CPSC-47000 Artificial Intelligence­

Lewis University

Course Project Description

# Introduction

As part of this course, you will work on a term long project. The goal of these projects is to apply the artificial intelligence knowledge you will learn in class. This project will be done in assigned groups. I will be choosing your groups and you will be able to see them using BlackBoard’s Project Groups link. This facility will provide you with collaboration tools you can use for your project.

To get started, you will need to first pick a topic. In week 2, you will submit your project title and a short description. This is not graded, but I will provide feedback and either approve the topic or let you know to pick another. Then you will continue research on your project and submit an initial proposal (including an abstract). I will then give you feedback and you will need to resubmit a revised proposal. You will then continue working on the project and produce both a written report and an oral presentation. You will submit the written report and present the work in class.

# Requirements

The project will involve the following steps:

**Step 1:** Pick a topic (see section 3 for ideas). Submit the project title and a short description to BlackBoard as a Word document. The topics are first-come, first-serve. No more than 2 teams can work on the same topic. I will email you if the topic is already taken.

**Step 2:** Do research – this means look for scholarly papers and find out what has already been done and what has not been done for this topic (be sure to cite these in your proposal and final report and list the references).

**Step 3:** Submit the proposal – this needs to include: a title, an abstract, an introduction, a discussion of related work - background, your methodology, and a timeline.

**Step 4:** Revise the proposal – this will be based on my feedback

**Step 5:** Submit a project report – must include: title, introduction, literature review, methodology, results, discussion, conclusion, and a list of references.

**Step 6:** Produce a presentation (e.g. PPT slides) and present your work in class (the exact date and time limit will be given later).

NOTE: Both the proposal and the report need to be written using IEEE format. You can do this easily just by using the following template (either for Word or LaTeX):

<http://www.ieee.org/conferences_events/conferences/publishing/templates.html>

The template describes how an IEEE paper should look like. Read it, then replace the parts with your own writing. However, use a SINGLE COLUMN layout.

The topic choice is first-come, first-serve, so the earlier you submit the topic, the better. If that topic is already chosen by another two groups, you will have to choose a different topic. Once a topic is chosen, you cannot change it unless you provide an adequate justification.

# Projects

Here is a list of projects you may choose:

1. Personal scheduler – develop a program that takes as input a person’s events along with priority preferences and develops an optimal schedule.
2. Cautious Route Finder - implement a route finding algorithm that incorporates the variability of travel times in the route selection process. For example, if route 1 travel time is 15+/-1 minutes and route 2 travel time is 14+/-5 minutes, then route 1 may be the better choice due to less variability. This route finder could also incorporate various other aspects of travel: distance, number of roads, safety, etc.
3. Study and implement algorithms for game playing in one of the following games: Candy Crush, 2048, Sudoku, Kriegspiel (variation of chess), or Texas Hold'em Poker.
4. Use OpenNERO software to implement the IDS search algorithm and compare it to A\* in the maze environment.
5. Use PROLOG to develop a rule-based expert system in some discipline. For example, car problem diagnosis agent or a shopping agent.
6. Use Bayesian networks to develop an expert system in some discipline that handles uncertainty. For example, car problem diagnosis agent or a shopping agent.
7. Machine learning – develop a neural network for recognizing certain objects.
8. Develop a vacuum robot agent and test it in simulations (you can use OpenNERO). Compare different strategies for effective vacuuming and compare to currently sold vacuum robots.

Note that you may choose other projects, but in either case, I will have to approve it. Email me if you're not sure a project is acceptable. No more than 2 teams can work on the same project.

# Grading

The grading of the project will be based on the following:

Proposal 40%

Written Report 30%

Oral Presentation 30%

**Proposal (only revision is graded) - 40%**

* Correct format/organization – 10 points
* Spelling/grammar/clarity of writing – 10 points
* Research – 10 points
* Idea creativity and complexity – 10 points
* Idea feasibility – 10 points

**Written Report - 30%**

* Correct format/organization – 10 points
* Spelling/grammar/clarity of writing – 10 points
* Research – 10 points
* Correctness (of methodology and results) – 10 points
* Significance of results – 10 points

**Oral Presentation - 30%**

* Preparation of materials (PPT slides, etc.) – 10 points
* Clarity of presentation – 10 points
* Timeliness – 10 points
* Correctness and ability to answer questions – 10 points