CPSC-57100 Artificial Intelligence

Lewis University

Course Project Description

# Introduction

As part of this course, you will work on a term long project. The goal of this project is to survey the state-of-the-art in a selected area of Artificial Intelligence and present this survey to the 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 3, you will submit your project title and a short description of the specific topic you plan to survey. 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 update on your project in week 5. This should include the description of the major problem or problems in the given topic, the list of common approaches found in literature, and the list of sources. You will submit your presentation slides in week 7. You will then present your project in week 8.

# Requirements

The goal of a survey is to summarize latest research work on the given topic, group the approaches used by different researchers, outline the main themes of the current research and identify open problems. It should also describe the applicability of the current research to real-world problems.

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.

**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 presentation and list the references on the final slide). Group the different works into categories and analyze, compare, and contrast them.

**Step 3:** Submit a project update.

**Step 4:** Continue working on the project based on feedback.

**Step 5:** Submit a project update that includes the description of the major problem or problems in the given topic, the list of common approaches found in literature, and the list of sources. Make revisions as suggested in feedback.

**Step 6:** Produce a presentation (e.g. PPT slides) and submit the slides.

**Step 7:** Present your work in class (the exact date and time limit will be given later).

# Projects

Here is a list of topics you should consider:

1. Dynamic scheduling under constraints.
2. Smart route finding algorithms.
3. Study latest game playing approaches in various games (e.g. for Texas Hold'em Poker).
4. Rule-based expert systems.
5. Deep reinforcement learning applications.
6. Bayesian network applications.
7. Logic-based approaches.
8. Vacuum robot navigation approaches.
9. How autonomous vehicle systems handle uncertain situations.
10. Drone navigation.

Note that you may choose other topics, but in either case, I will have to approve it. Email me if you're not sure a project is acceptable.

# Grading

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| --- | --- | --- | --- |
| Project Grade Rubric | | | |
| Category | Unsatisfactory (0-1 points) | Satisfactory (2-3 point) | Distinguished (4-5 points) |
| Preparation of Materials | * Slides contain a lot of text in paragraph form * Almost no figures, tables, or animations * Fonts and color choices make slides unreadable (e.g. small blue text on a black background) | * Slides contain a lot of text * Limited use of figures, tables, or animations * Text font is too small for easy reading * Colors have insufficient contrast and are pleasant to the eye | * Not too much text * Extensive use of figures, tables, or animations * Text is sufficiently big to read from afar * Colors have sufficient contrast and are pleasant to the eye |
| Clarity | * Slides do not follow a logical order * Terms are not defined * Explanations lack details | * Some slides are not arranged in logical order * Some terms are not properly defined * Explanations do not provide enough detail to understand the main ideas and results | * Slides are arranged in logical order * Terms are properly defined * Explanations provide enough detail to understand the main ideas and results |
| Timeliness | * Presentation is either very short or goes significantly past the time limit * Answers to questions are either very lengthy or extremely short | * Presentation is somewhat short or goes past the time limit * Answers to questions are too lengthy or lack sufficient explanation | * Presentation makes full use of allotted time, but does not go over limit * Answers to questions are brief, but provide a sufficient explanation |
| Content | * Insufficient research presented * Various approaches in the field are not specified * Sources are presented in isolation * Main themes are not identified * No open problems in the field are identified | * Research is not well summarized * Various approaches in the surveyed field are presented * Some main themes of current research are outlined * Some open problems are presented | * Research is well summarized * Various approaches in the surveyed field are categorized, compared, and contrasted * Main themes of current research are outlined * Open problems are identified |
| Research Depth and Breadth | * Most sources do not come from high-quality journals or conference proceedings related to the chosen topic * Very few sources used * Sources and/or their explanations lack depth | * Only few sources come from high-quality journals or conference proceedings related to the chosen topic * Breadth of research is limited * May have many sources, but of limited number within a particular area | * Most sources come from high-quality journals or conference proceedings related to the chosen topic * Sufficiently large number of sources to represent the current state of the work on the topic * Great depth of research on the topic is explained |
| Correctness and Ability to Answer Questions | * Presented ideas and answers to questions are completely inaccurate * Most questions are unanswered | * Presented ideas and answers to questions have some inaccuracies * Some questions are not answered | * Presented ideas and answers to questions are completely accurate * All questions are answered |