CS662 Intelligence Systems

Syllabus

Instructor: Dr. Lundy Lewis

Course Description:
Our course emphasizes the application of AI methods to real-world problems. From the text we will learn about many AI methods and the kinds of generic real-world tasks to which they apply. Students are encouraged (i) to think about tasks at their workplace that require human intelligence and (ii) to speculate how an AI method might be used to automate the task more efficiently (e.g. with respect to time saved, cost savings, or quality of solutions). Course work includes a project that explores and implements an AI method to perform a work-related task, homework assignments (to be assigned during the course), a midterm take-home exam, and a final take-home exam.

Grades:
Grades are determined as follows:

- homework 20%
- midterm (take-home) 25%
- final (take-home) 25%
- and the project/presentation 30%

These are approximate weightings. Comparisons of performance will be considered also.

The Project:
Students will select a task (preferably a work-related task), analyze the task, choose and justify an AI method to perform the task, implement the method, and evaluate its performance. The project is more a "thinking through" exercise than a programming exercise.

A one-page project proposal describing your selected task is due Session 5, and an update is due Session 11. As you learn about alternative AI methods during the course, you should pick one method to use to automate the task and start implementing a prototype. The project will culminate in a written report and a short oral presentation, due the last day of class. The instructor will be available for discussion and "brain-storming" throughout the project.

Computers and Programming Languages:
For the project and the homework assignments that require programming, students may choose any computer and any language.

Course Schedule:

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<thead>
<tr>
<th>Session</th>
<th>Topic</th>
<th>Assignment</th>
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<tbody>
<tr>
<td>1</td>
<td>Course Description and Housekeeping</td>
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<tr>
<td>2</td>
<td>Introduction to AI</td>
<td>Read Chapter 1</td>
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<td>3</td>
<td>Intelligent Agents</td>
<td>Read Chapter 2</td>
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<td>4</td>
<td>Solving Problems by Searching</td>
<td>Read Chapter 3</td>
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<td>5</td>
<td>Informed Search Methods</td>
<td>Read Chapter 4</td>
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<td></td>
<td>Project proposal due</td>
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6  Agents that Reason Logically  Read Chapter 6
    Midterm exam distributed
7  First-Order Logic  Read Chapter 7
8  Review  Midterm exam due
9  Inference in First-Order Logic  Read Chapter 9
10  Planning  Read Chapter 11
11  Planning and Acting  Read Chapter 13
    Project update due
12  Uncertainty  Read Chapter 14
13  Probabilistic Reasoning Systems  Read Chapter 15
14  Learning from Observations  Read Chapter 18
    Final exam distributed
15  Learning in Neural and Belief Networks  Read Chapter 19
16  Wrap-up  Project presentations in class
    Project report due
    Final take-home exam due