CMPT 310 - D100 Artificial Intelligence Survey

Instructor(s): Jim Delgrande

Calendar Objective/Description:
Provides a unified discussion of the fundamental approaches to the problems in artificial intelligence. The topics considered are: representational typology and search methods; game playing, heuristic programming; pattern recognition and classification; theorem-proving; question-answering systems; natural language understanding; computer vision.

Instructor’s Objectives:
The goal of this course is to provide students with a survey of different aspects of artificial intelligence (AI). We will start with the AI-as-search paradigm, and discuss generic search strategies and heuristic-based improvements. Logic, in particular first-order logic, will be presented as a formalism for representing knowledge in AI systems. The use of probability as a mechanism for handling uncertainty in AI will be presented, with a focus on Bayesian networks. Finally, we will explore the design of AI systems which use learning to improve their performance on a given task. In addition to these topics, if time permits, other topics such as computer vision, natural language processing, and robotics will be addressed.

Prerequisites:
CMPT 225 and (MACM 101 or ENSC 251 and ENSC 252)). Students with credit for CMPT 410 may not take this course for further credit.

Topics:
- Search
- Logic
- Constraint satisfaction problems
- Game playing
- Planning
- Reasoning under uncertainty (probability)
- Bayesian networks
- Hidden Markov Models, Dynamic Bayesian networks
- Utility theory, Decision networks
- Learning

Grading:
Grading will be announced the first week of class. Evaluation will be based on four programming and written assignments as well as a midterm and final exam.

Students must attain an overall passing grade on the weighted average of exams in the course in order to obtain a clear pass (C- or better).

Required Books:
Academic Honesty Statement:

Academic honesty plays a key role in our efforts to maintain a high standard of academic excellence and integrity. Students are advised that ALL acts of intellectual dishonesty will be handled in accordance with the SFU Academic Honesty and Student Conduct Policies ( http://www.sfu.ca/policies/gazette/student.html ).