CMPT 411 - D100 Knowledge Representation

Instructor(s): Jim Delgrande

Calendar Objective/Description:
Formal and foundational issues dealing with the representation of knowledge in artificial intelligence systems are covered. Questions of semantics, incompleteness, non-monotonicity and others will be examined. As well, particular approaches, such as procedural or semantic network, may be discussed.

Instructor’s Objectives:
The area of Knowledge Representation and Reasoning is primarily concerned with encoding general world knowledge symbolically, in a form suitable for automated reasoning. This course will focus on central KRR methodologies, giving equal time to representational issues and reasoning issues.

Prerequisites:
completion of nine units in Computing Science upper division courses or, in exceptional cases, permission of the instructor.

Topics:
- Introduction: What do we mean by knowledge representation and why is it interesting?
- Logic: expressing knowledge, first-order logic, Horn clause logic
- Production systems (rule-based systems)
- Description Logics
- Defaults
- Probabilities and uncertain reasoning
- Diagnosis and abductive explanation
- Reasoning about action
- Planning
- Expressiveness and tractability

Grading:
The exact marking scheme will be decided in the first week of class in consultation with students in the course. Tentatively, four assignments and a midterm test and a 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).

Recommended Books:
Knowledge Representation and Reasoning, R. Brachman and H. Levesque, Elsevier Science, 2004, 97815558609327, This text is available online. As well, it is between "required" and "recommended"

Reference 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 ).