COMP 4190 – Artificial Intelligence

Calendar Description: Reasoning with temporal knowledge; causal reasoning; plausible reasoning; nonmonotonic reasoning; abductive reasoning.

Prerequisite: COMP 3190

Outline

1) Topics in knowledge representation (2 ½ weeks)
   Taxonomic knowledge, inheritance, temporal knowledge, logics for temporal reasoning, causal knowledge: logical theory of causation, Bayesian networks
2) Plausible reasoning (2 weeks)
   Probabilistic reasoning, Dempster-Shafer theory, fuzzy sets and fuzzy logic
3) Nonmonotonic reasoning (2 weeks)
   Truth maintenance, default reasoning
4) Advanced planning (2 weeks)
   Nonlinear planning, hierarchical planning, truth maintenance/dependency-directed backtracking in planning, complexity in planning
5) Abductive reasoning (2 ½ weeks)
   Probabilistic and logic-based models of abduction applications of abduction in diagnosis, plan recognition, and parsing
6) Constraint satisfaction (2 weeks)
   Constraint satisfaction strategies

The implementation of many of the algorithms will be discussed in class (using Lisp).

Text: George Luger, *Artificial Intelligence – Structures and Strategies for Complex Problem Solving*, Addison-Wesley.

Note: Specific topics may vary depending on the instructor.