COMP 4190 – Artificial Intelligence

Calendar Description: Reasoning with temporal knowledge; causal reasoning; plausible reasoning; nonmonotonic reasoning; abductive reasoning.
Prerequisite: COMP 3190 and [one of STAT 1150, STAT 2000 (B), STAT 2001 (B), STAT 2220, or PHYS 2496].

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

Text: Stuart Russell and Peter Norvig, *Artificial Intelligence - A Modern Approach,* Prentice Hall, 1995 & 2003