Lecture 10: Knowledge Representation Overview

- Shubert L, Semantic nets are in the eye of the beholder, in Principles of Semantic Networks, pp. 95-107.

We claim that both of these papers miss something important about knowledge representation. They both claim to be critiques of a representation mechanism and both take a kind of reductionist view, claiming that when examined closely, the representation has less than meets the eye. Both use logic as a kind of testing ground; the Shubert paper has a slightly less narrow field of view. See if you can tell what parts of their critique meet the issues, and which miss.


The basic argument here is that a knowledge representation performs five important roles and that ignoring any one of them is a bad idea. What are the five roles and how well do they fit with any representation you have in mind?

Lecture 11: Pragmatic Issues in Knowledge Acquisition


Lecture 12: Uncertain Reasoning

  Read this survey to get a sense of the primary issues addressed and progress made in uncertain reasoning.
  Read this short article to get a good, quick tutorial on Bayesian nets, one of the more successful and important tools for uncertain reasons.
  Examine the idea of knowledge-based model construction described in this paper, and consider not only its application to decision-theoretic models, but also its applicability to constructing models using other types of representations.
  Read this to get a sense of the rationale behind work in fuzzy logic, and what its proponents believe it has to contribute.
- Elkan C, The paradoxical success of fuzzy logic, Proc AAAI, 1993, pp.986--703, and
  Reply to Comments on The paradoxical success of fuzzy logic, IEEE Expert,
Read this for an eye-opening analysis of the foundations of fuzzy logic that brings into sharp relief the question: what does fuzzy logic actually do? Is it a reasonable model of uncertainty? Do programs based on it work because of it, or despite it? This is an excellent example of some hard-headed thinking that is done too rarely; Elkan asks the probing and important question about these programs, asking why do they work, not just whether they do.

Lecture 13: Blackboards