KNOWLEDGE REPRESENTATION MEETS KNOWLEDGE ACQUISITION: WHAT ARE THE NEEDS, AND WHERE IS THE LEVERAGE?

Panel Presentation
organized by
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Working on knowledge acquisition requires making a commitment to a particular knowledge representation. This panel will explore the implications of that commitment, focusing on the ways in which choice of a particular representation can facilitate or hinder the knowledge acquisition task. Of particular interest is the role played by the presence or absence of a formal semantics in the representation language. Knowledge representations used in knowledge acquisition vary in their formality from unstructured LISP through the minimal structure imposed by production rules, all the way up to highly formalized languages like those in the KL-ONE family. What this panel seeks to do is to bring together researchers with backgrounds in knowledge-based systems, knowledge acquisition, and knowledge representation. The panel members represent a range of styles from pragmatic to theoretical, and will be asked to compare and contrast their experiences with respect to questions like the following:

- What are the crucial problems to be solved in knowledge acquisition?

- How does the kind of knowledge one is concerned with acquiring affect the choice of representation? Conversely, has the adoption of particular knowledge representations fostered a concern with certain kinds of knowledge over others?

- What are the important aspects of knowledge representations that led to their adoption by the panelists?

- What aspects of those knowledge representations have turned out to facilitate addressing the important knowledge acquisition issues?

- What aspects of those knowledge representations have turned out to hinder knowledge acquisition? How have they interfered?

- What implications do the panelists see in knowledge acquisition for work that they would like to see done in knowledge representation, and vice versa?

The time for a discussion of this issues is particularly ripe because of the resurgence of interest in knowledge acquisition and machine learning, coupled with the development of knowledge representation languages that have been around long enough to have been exercised in several knowledge based systems. The panelists who will be presenting viewpoints on these issues include:

- **Richard Fikes,** *Intellicorp.* Fikes is concerned with the use of powerful declarative knowledge representation and inference engines in knowledge based systems, and will discuss their implications for knowledge acquisition from the standpoint of his experience with KLONETalk, KRYPTON, and KEE.

- **Casimir Kulikowski,** *Rutgers University.* Kulikowski is concerned with the ways in which the propositional representation of EXPERT, along with medical semantic constraints, can enable development of knowledge base refinement and acquisition heuristics that would have been very difficult in other representations.

- **John McDermott,** *Carnegie-Mellon University.* McDermott is interested in how a knowledge acquisition tool might figure out what kinds of knowledge it needs to acquire and of how a knowledge acquisition tool might be made smart (ie, be a tool that gets a lot of mileage out of asking a relatively small number of questions). He is also interested in identifying how the problem-solving method that is appropriate for some set of tasks dictates how knowledge should be represented for those tasks.

- **Ramesh Patil,** *Massachusetts Institute of Technology.* Patil is interested in issues of encoding large bodies of knowledge. He focuses on what one needs to do if one has to build a representation that supports shallow reasoning for efficient performance, and yet can fall back on deeper understanding when needed to deal with difficult cases or to provide justifications for shallow reasoning. Among his concerns are the limitations of languages with well-defined semantics.