Lecture 7: Problem Set 6 (Due Wednesday April 4th, 7:00PM)

Reading: (a) Emotion Machine, Chapter 5
(b) EM−ONE: An architecture for reflective commonsense thinking, 11−26.

Problem 1

In order to find meaningful answers you must first be able to formulate good questions. List ten questions you would like to answer about Chapter 5.

Problem 2

In this chapter, Minsky describes the layers of Model−6. These layers are useful for categorizing thought processes--i.e. self−reflective layers focus on debugging and building models of the system’s own abilities and limitations.

a) List 5 reasons why developing a way to classify thought processes can be useful.

Problem 3

In class, Marvin has described his experience with learning how to play chess where, as a beginner, moving the knight required interpreting rules. With more experience, he was able to visualize the appropriate 8 positions ‘immediately’.

a) In psychology, this phenomenon is known as chunking; and in computer science: compiling. Describe another type of learning where this takes place and relate it aspects of compiling software.

b) In Cyc, unlike people its reasoning performance does not improve with repetition. What could you add to Cyc to give it this ability?

Problem 4

In the section on Learned Reactions, Minsky describes how IF−>DO rule alone are not enough because there are always exceptions for each rule, which would make the assertion false.

a) What benefits does adding ’THEN’ to IF−>DO rules provide?

b) Describe a process that would allow a knowledge base to keep a useful rule even though it has many exceptions.

Problem 5

A big problem with using rules as a representation is knowing the level of descriptions to include within the conditional. If the description is vague/ambiguous, it may match too many cases; however, if it is too specific or precise, it may never match another situation!

Commonsense knowledge consists of generalizations;, there are often exceptions for each assertion or rule, and commonsense knowledge is densely interconnected. Because of this, it is indirect to talk about assertions being ‘true’ or ‘false’ without describing context or the desired inference. Instead, we can characterize knowledge as ‘useful’ within the context of solving a specific problem.

a) Take a look at the first 500 entries in the OpenMind project, http://web.media.mit.edu/~dustin/6.868/omcs−h500.txt , choose

Cite as: Marvin Minsky, course materials for 6.868J/MAS.731J The Society of Mind, Spring 2007. MIT OpenCourseWare (http://ocw.mit.edu/), Massachusetts Institute of Technology. Downloaded on [DD Month YYYY].
your favorite 5 assertions and describe problem contexts in which that knowledge would be useful for solving the problem.

[Answering questions is one type of problem solving]