CS 718 **SEMANTICS, COMPUTATION, AND COGNITION** **Spring 1993**

SYLLABUS

Professor: Dr. William J. Rapaport, 214 Bell Hall, 645-3193,
Office Hours: To be announced, and by appointment.

Class Meetings: TTh 11:00 A.M.–12:15 P.M.

Topics:

> The question of how one understands the language one thinks in does seem to be a peculiar one. (Barry Loewer, "The Role of 'Conceptual Role Semantics'," (1982): 310.)
>
> [T]he crucial feature of cognitive practice [is] ... the ability to make representations. (Marx W. Wartofsky, *Models: Representation and the Scientific Understanding* (1979): xiii.)

What does it mean to say that we have knowledge of the semantics of our language, and how do we come to have it? That is, what does it mean to say that we understand our language? And can a non-human—say, an ape or a computer—have such knowledge? What does it mean for *any* cognitive agent to understand language? Viewed from a very high distance, my answer is this:

> Understanding is a correspondence between two domains; a cognitive agent understands one of those domains in terms of the other.

I call this "semantic" understanding. But if a domain, A, is to be understood in terms of another, B, how, then, does the agent understand domain B? The simplest answer, I believe, is, in good recursive fashion, that B is also understood in terms of a domain, namely—since good recursion needs a base case—itself! But how can something be understood in terms of itself? The answer is: syntactically. Put briefly, bluntly, and a bit paradoxically, my thesis is that, at bottom,

semantic understanding is syntactic understanding.

And any cognitive agent capable of syntax—of symbol manipulation—is, thus, capable of understanding language.

Clearly, we need to zoom in on this broad overview and focus on the details. Along the way, we shall consider a seeming grab-bag of topics such as computer implementations, the Chinese-Room Argument, conceptual-role semantics, methodological solipsism, natural-language understanding, language understanding by apes, computational lexicography, newspaper photographs with captions, and even Helen Keller.

Attendance: You will be expected to attend all meetings. Readings and assignments will be announced during the seminar meetings. Be sure to get a classmate's phone number,[1] so that you will not miss anything in the unlikely event that you miss a class.

Important Dates:

Tuesday	January	26	First meeting
Thursday	March	11	Term project proposal due
Friday	March	19	*** Last day to withdraw with a grade of 'R' ***
Monday–Sunday	April	5–11	Spring break; no classes
Tuesday, Thursday	April	20, 22	no meetings (I'll be out of town)
Thursday	May	6	Last meeting

[1] For instance, 1 or 2 people sitting next to you in class, whoever they are!

Readings: Students registered for the seminar will read portions of a book I am in the process of writing, as well as writings by computer scientists, philosophers, and other cognitive scientists that formed the basis for my theory. Some of these readings will be handed out in class; others will be put on reserve in SEL.

Requirements: Registered students will be expected to lead one or more class discussions on these readings and write a 10-15 page paper and/or proposal for a computational research project implementing some of the ideas.

Miscellaneous: The seminar is open to interested graduate students in Computer Science, Anthropology, Geography, Linguistics, Philosophy, Psychology, or any of the other cognitive sciences.

Grading: In accordance with departmental regulations, only S/U grades will be given.

Incompletes: It is University policy that a grade of Incomplete (with a default grade) is to be given only when a small amount of work or a single exam is missed due to circumstances beyond the student's control, and that student is otherwise doing passing work. I will follow this policy. Incompletes will normally have to be made up by the end of the Fall 1993 semester. The default grade will automatically be assigned after that if the work has not been completed.