ARTS

The thinking machine

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There are things which people don't understand, Schank says. "Computers will fail to understand humanity in the same way that an untrained aunt might fail to understand her sister's desire to get a divorce. When you read a story about terrorism, you don't feel that just because you are not the terrorist, the rest of being human that you really understand the terrorist's actions or his views. Having past experiences that involve human feelings facilitates important dimensions of your understanding of a story, allowing you to experience it in your own way. Likewise, an intelligent computer would have its own particular set of experiences of reading and remembering terrorism stories, in addition to the principles and details of international terrorism which have been programmed into it."

This, Schank says, is an example of "Cognitive Understanding" at work, a mid-ground between "making sense" and "cooperating empathy" and something we can expect from Digital's DECmate III in the next ten years. "Any program that effectively explains the steps it has gone through understands at the level of MAKING SENSE. At the level of COGNITIVE UNDERSTANDING the program must be able to explain why it came to the conclusion it did, what conclusions or lines of reasoning it rejected and why it rejected them, and how previous experience influenced its response."

Schank then proceeds to tell us how the computer might represent these concepts. He is critical of linguistic approaches to natural language parsing which simply tear sentences apart and analyze them in terms of each individual word. The whole is greater than the sum of the parts, he says, and what counts is not the word but the knowledge, the concepts behind that word. "An understanding system, whether human or computer, has to depend on a conceptual representation of events, not on particular words or sentences. And, while there are a huge number of words, it seems that human endeavour can be organized along the lines of a small number of concepts."

Schank's Yale laboratory thus represents "possessing-changing-action" with the concept "ATRANS" which triggers rules that include the set of inferences associated with ATRANS."

On the basis of such primitive concepts like the computer can use "scripts," "prepackaged sets of expectations, inferences and knowledge that are applied in common situations, like a blueprint for action without the details put in." Schank shows how a computer can "understand" the act of eating a meal in a restaurant through the use of a restaurant script. Scripts are special sets, Schank admits, but so are people; you would not ask someone to one-to-one fold another subject of which he has no knowledge.

Professor Roger Schank will be giving a public lecture at MIT on Thursday, November 15, and this review will be concluded in the November 16 issue of The Tech.

Jonathan Richmond

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