Professor John McCarthy Father of AI

Articles

What AI Needs From Computational Linguistics

A short note on the need for programs that can translate natural language texts into collections of sentences in mathematical logical language.

Reaching human-level AI will go much faster when AI programs can learn by reading the information already available on the internet. This requires programs that can translate natural language texts into collections of sentences in mathematical logical language.

Why translate to logic? Why can't the information be used directly in natural language form?

Two reasons.

1. Natural language does not have a full set of rules of inference. At least linguists haven't identified them yet.

2. Very little of the information people have about the world is represented internally in natural language. Even information readily expressed in language isn't in linguistic form internally.

Mathematical logical languages are the only languages available with good sets of inference tools. First order logic is complete for valid inference, and great progress has been made in providing methods of nonmonotonic inference.

Also human level communication between computer programs with other programs or with people requires a certain level of knowledge and intelligence in the programs. The knowledge needed for people to speak to and understand each other is mostly not encoded in language. If we knew what it is, both AI and linguistics would be helped.

We now go to a 1976 article raising some of these problems. An example for natural language understanding and the AI problems it raises

Erik Mueller at M.I.T. tells us (2000) that the problems are almost all unsolved and measures the capability of present systems in dealing with them.

What is the road to progress?

1. Reify a lot more. In particular, use meaning(phrase,s), where s is a mental situation to map phrases into an abstract space of meanings. 2. Use a partial inverse say(idea,s) to give the linguistic expression of an idea. 3. Use a logical theory of meanings.

This will be harder than what people have been doing.

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