The Future of AI—
A Manifesto

John McCarthy

The long-term goal of AI is human-level AI. This is still not directly definable, although we still know of human abilities that even the the best present programs on the fastest computers have not been able to emulate, such as playing master-level go and learning science from the Internet.

Basic researchers in AI should measure their work as to the extent to which it advances this goal.

AI research should not be dominated by near-term applications. DARPA should recall the extent to which its applied goals were benefitted by basic research. NSF should not let itself be seduced by impatience.
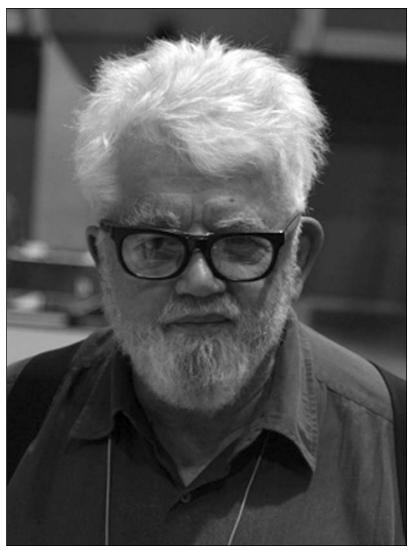
The so-called AI winter was dominated by people who lost money in companies. That's a common phenomenon.

I think the best hope for human-level AI is logical AI, based on the formalizing of commonsense knowledge and reasoning in mathematical logic.

Formalizing common sense requires extensions to mathematical logic including nonmonotonic reasoning and extensive reification, e.g., of concepts and also contexts. The reifications require appropriate reflection schemas.

Approaches based on simulating aspects of the human nervous system, such as neural nets, may also work. Big changes in approach are almost certainly needed, e.g., systems that distinguish appearance from reality, such as learning about three-dimensional objects from two-dimensional images or from a sense of touch.

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John McCarthy has been a professor of computer science at Stanford University since 1962 and became professor emeritus in 2001. His research is mainly in artificial intelligence, for which he received the Turing Award in 1971. McCarthy coined the term *artificial intelligence* in an August 1955 proposal for a working group meeting at Darmouth College in summer 1956. He originated the Lisp programming language, publishing its design in *Communications of the ACM* in 1960, and began the initial research on general-purpose time-sharing computer systems. His web page address is www-formal.stanford.edu/jmc/. McCarthy served as president of AAAI from 1983–84.