XXI. ARTIFICIAL INTELLIGENCE[*†]

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RESEARCH OBJECTIVES

The purpose of our work is to investigate ways of making machines solve problems that are usually considered to require intelligence. Our procedure is to attack the problems by programming a computer to deal directly with the necessary abstractions, rather than by simulating hypothetical physiological structures. When a method for solving a problem is not known, searches over spaces of potential solutions of the problem, or of parts of the problem, are necessary. The space of potential solutions of interesting problems is ordinarily so enormous that it is necessary to devise heuristic methods[1-3] to replace the searching of this space by a hierarchy of searches over simpler spaces. The major difficulty, at present, is the excessive length of time required for building machinery or even for writing programs to test heuristic procedures. For this reason, a major part of our effort is going into the development of ways of communicating with a computer more effectively than we can now communicate. This work has two aspects: development of a system for instructing the computer in declarative, as well as imperative, sentences, called the advice-taker,[4] and development of a programming language called LISP[5-8] for manipulating symbolic expressions that will be used for programming the advice-taker system and will also be of more general use.[9] We are embarking on a major effort to integrate this work into the new M. I. T. time-shared real-time computer system.

Maintenance and further development of LISP will be continued by Professor J. McCarthy, who is now at Stanford University. We plan to continue close association with his group.

It is our belief that the field of artificial intelligence is limited only by the amount of qualified effort that can be put into it, and by the machine limitations that still prohibit more ambitious experiments.

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