Making machines behave intelligently can be undertaken with either of two emphases—biological imitation or effectiveness in the world. One method imitates features of human intelligence, using either neurophysiology or psychology. The other studies the facts and reasoning needed to achieve goals in the world.

Wagman wants a theory of intelligence applicable to both humans and machines. Therefore, he compares the performance of programs treated in the AI literature with psychological experiments.

Many of Wagman's formulations strike me as inaccurate.

"From the standpoint of human intellect, information is represented in natural language in the case of the human entity, and as programming language in the case of the artificial intelligence entity." p.23-24

Most human information is not represented internally as sentences, as evidenced by the difficulty we have in expressing it as sentences. AI programs mostly use logical sentences, semantic nets or productions.

"As indicated earlier, the von Neumann computer, as a serial processor, is not an adequate model of human language comprehension." p.89

No computer is in itself a model of language comprehension.

"The correctness of a program's response to a given input does not signify understanding but correct mechanistic correspondences of input and program structures. The attribution of language comprehension to artificial intelligence programs is an act of illusory anthropomorphism comparable to the attribution of symphonic comprehension to digital music systems." p.102-103

Here and elsewhere, Wagman argues that there is a fundamental difference between artificial and human intelligence.

He doesn't say whether this difference applies just to present AI programs or to all possible AI programs. Although his criteria for real understanding are not made explicit, he is right that the programs he discusses are deficient. There are two problems. First the programs are not good enough at what they do; e.g. they can't answer the questions humans can. Second their understanding is limited in to a definite restricted context.

Nevertheless, Wagman has a theory worthy of attention, and his account of a large number of AI programs is informative, although not a substitute for the original papers or for textbooks on cognitive science or AI.

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