

# THE ADVICE TAKER REVISITED

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- The long term goal of AI is human level AI.
- “Programs with Common Sense” —1959 Advice Taker (AT).  
[www-formal.stanford.edu/jmc/mcc59.html](http://www-formal.stanford.edu/jmc/mcc59.html).
- First proposal to use logical languages to represent what an AI system believes and to infer what it should do.

- Representation of facts independent of purpose. When objects collide there's a noise. make noise, avoid noise, explain no noise, design quiet car.

## PROPOSALS FROM AT THAT ARE USED

- Use logic to represent information declaratively.
- [Common Sense Informatic Situation] In general a thinking human is in what we call the *common sense informatic situation*, as distinct from the *bounded informatic situation*. The known facts are necessarily incomplete. We live in a world of middle-sized object which can only be partly observed and in which the consequences of our actions can only partly be determined.
- Represent effects of actions.

- Prove logically that a sequence  $a$  of actions achieves goal  $g$ .
- System does action  $a$  when  $should(a)$  is inferred.

## IDEAS FROM AT THAT ARE NOT MUCH USED

- Complex expressions as objects— $Want(At(I, Airport))$   
 $Want(At(I, x))$ .
- Formal generalization
- Domain dependent logical inference heuristics.
- Declarative expression of domain dependent inference heuristics. J. Sierra does it. S. Makarios is doing it.

## DEVELOPMENTS IN LOGICAL AI

- Frame, qualification and ramification problems.
- Elaboration tolerance
- Non-monotonic reasoning, default reasoning
- Fast propositional satisfiability solvers
- Probability based problem formulations and solvers.
- I think the problems encountered and partly solved in logical AI will appear in any approach aiming at human level.

## ADVICE ON ADVISABLE SYSTEMS

- Use at least full first order logic.
- Do not only use unary predicates. [What's a convertible?](#)
- Advisable behavior requires nonmonotonic reasoning.
- Include heuristic advice.
- Don't make an English interface a major part of the project. [For every boy there's a girl who loves only him.](#)
- Do not emphasize beginners.

## MORE ADVICE ON ADVISABILITY

- *elaboration tolerance*—[www-formal.stanford.edu/jm](http://www-formal.stanford.edu/jm)

There's an oar on each bank, but the boat needs two oars to carry two people.

- Use *Drosophilas* for research and select them carefully, so that the experiments will be maximally informative.

- Remark: The geneticists have used *Drosophilas* since 1910, but the *Drosophilas* of today are no better than those of 1910.



## A POSSIBLE DROSOPHILA

- Building and moving towers of different kinds of blocks.
- Advice: green blocks don't fit on red blocks, towers 5 high fall down, decide what blocks are to be in a tower before considering moving any blocks. As long as there are moves to final position, keep doing them. Do not put a block on another unless it is a move to final position. A block is in final position if it is on the block it is supposed to be in the goal (or on the table if that is its position in the goal), and the block it is on top of is in final position. Postpone postponable goals. STRIPS as

advice in situation calculus. Never play cards with a man named Doc; never eat at a place called Mom's; never marry a woman with more troubles than you.

- From George Polya's *How to solve it*—
- If you suddenly find yourself in danger, think what you just did and take it back.
- Some kinds of advisability depend on self-awareness. [Avoid wishful thinking.](#)

# NOW'S THE TIME, BUT IT WON'T BE EASY.

- Start with an easy problem.
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