Artificial Intelligence: A New Synthesis
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Some Clarifications
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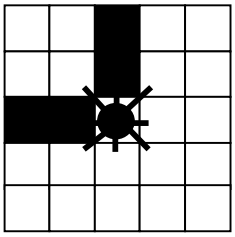
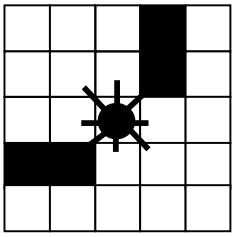
Subsequent editions of the book may include some of the following clarifications

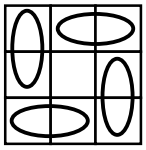
1. The "no-tight-space" condition mentioned on page 21 of the text is ambiguous. Intuitively, the condition attempts to rule out configurations, such as the ones shown below, in which the robot would be confused about which boundary to follow:

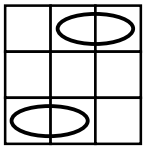


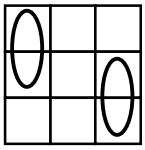


Since there are many such confusing configurations, the condition is difficult to state succinctly. But note that the robot perceives the world only through the values of the features x_1, x_2, x_3, and x_4, defined on page 24. Thus it suffices to define the no-tight-space condition in terms of those features alone.

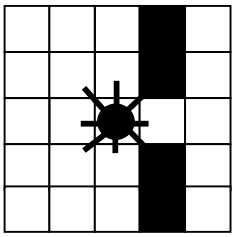
First, I define the conditions diagrammatically as follows. We rule out any configurations in which each of the sets of cells marked by ellipses in the diagrams below have one or more cells occupied and in which the other cells are empty. That is, we rule out any configurations for which the Boolean function $x_1\, x_2\, x_2\, x_4 + x_1\, x_3\, \overline{x}_2\, \overline{x}_4 + x_2\, x_4\, \overline{x}_1\, \overline{x}_3$ has value 1.

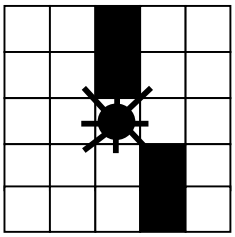






Note that the following configurations are among those that are not ruled out by this condition:





The reader might justifiably complain that these configurations contain “tight spaces,” but they are invisible to the robot's perceptual apparatus and cause no confusion about which action should be executed.

2. The non-recursive Tower-of-Hanoi algorithm stated in Exercise 5.3 (page 81) is overly complex. There is a much simpler, stateless algorithm. In the simpler one, we stipulate that D_3 and D_1 must always move clockwise, and that D_2 must always move counterclockwise. We always move the largest disc that can be moved in its stipulated direction. Assume that disc can be sensed by sensory features B_1, B_2, and B_3. B_i has value 1 if and only if disc D_i is the largest disk that can be moved in its stipulated direction. (Otherwise it has value 0.) The exercise should be replaced by one that asks for a production system that uses these features and implements the simple algorithm.

3. Section 17.3 (Maintenance in Dynamic Knowledge Bases) is an overly brief description of truth maintenance and its various applications in reasoning and problem solving. Future editions of the book will expand on this topic. In the meantime, the reader should consult some of the references listed on page 298.

4. On page 422, Austin should be credited with inventing the idea of speech acts. (Austin, J., *How to do Things with Words*, Cambridge, MA: Harvard University Press, 1962.)

5. The fact that “ . . . speakers do not usually send redundant information” (stated in the middle of page 437) is one of a set of *conversational postulates* that most language users are presumed to follow. For more on conversational postulates, see Grice, H., “Logic and Conversation,”in Cole, P., and Morgan, J., (eds.), *Studies in Syntax, Vol. III*, New York: Seminar Press, 1975.