CHAPTER 14

- **Artificial intelligence (AI):** The part of computer science that explores techniques for incorporating aspects of intelligence into computer systems.
- **Axon:** The part of a neuron that allows the neuron to send stimuli to other neurons.
- **Backward chaining:** A type of inference that begins with a proposed conclusion and tries to match it with the "then" clauses of rules; it then looks at the corresponding "if" clauses and tries to match those with assertions, or with the "then" clauses of other rules.
- **Connectionist architecture:** An architecture characterized by a large number of simple processors with multiple interconnections.
- **Deliberative strategy:** States that a robot must have an internal representation of its environment and that its actions in response to some stimuli are programmed based on this model of the environment.
- **Dendrites:** The parts of a neuron that allow the neuron to receive stimuli from other neurons.
- **Expert systems:** Systems that contain at least two components, a knowledge base and an inference engine, and that attempt to mimic the human ability to engage pertinent facts and string them together in a logical fashion to reach some conclusion; also called knowledge-based systems or rule-based systems.
- **Explanation facility:** The part of a rule-based system that allows the user to see the assertions and rules used in arriving at a conclusion.
- **Formal language:** The language of formal logic.
- **Forward chaining:** A type of inference that begins with assertions and tries to match those assertions to the "if" clauses of rules, thereby generating new assertions.
- **Heuristic:** An educated guess.
- **Intelligent agent:** A form of software technology that is designed to interact collaboratively with a user somewhat in the mode of a personal assistant.
- **Knowledge engineering:** A process through which the builder of a rule-based system acquires the information for the knowledge base by consulting "experts" in the domain and mining their expertise.
- **Knowledge:** A body of facts or truths.
- **Knowledge-based systems:** Systems that contain at least two components, a knowledge base and an inference engine, and that attempt to mimic the human ability to engage pertinent facts and string them together in a logical fashion to reach some conclusion; also called expert systems or rule-based systems.
- **Modus ponens:** A reasoning process; means "method of assertion."
- **Neural networks:** Artificial intelligence networks built using a connectionist approach.
- **Neuron:** A cell capable of receiving stimuli, in the form of electrochemical signals, from other neurons and sending stimuli to other neurons.
- **Reactive strategy:** Uses heuristic algorithms to allow a robot to respond directly to stimuli from its environment.
- **Robot:** A device, often human-like in form, that can gather sensory information from its surroundings and autonomously perform mechanical actions in some sort in response.

- **Rule-based systems:** Systems that contain at least two components, a knowledge base and an inference engine, and that attempt to mimic the human ability to engage pertinent facts and string them together in a logical fashion to reach some conclusion; also called expert systems or knowledge-based systems.
- **Solution path:** A path that takes us from the initial state of a state-space graph to the goal state.
- **State-space graph:** A graph in which each node represents a "state" of a problem.
- **State-space search:** A search to find a solution path through a state-space graph.
- **Swarm intelligence model:** A model that uses simple agents (analogous to ants in a colony of ants) that can operate independently, can sense certain aspects of their environment, and can change their environment.
- **Synapse:** The gap between the axon of a neuron and the dendrites of other neurons.
- **Turing test:** A test for intelligent behavior in machines proposed by Alan Turing in 1950.