

04.05 Exercises for Chapter 04

Exercise 04.1

Respond to the following questions and imperatives with a sentence or two and, if needed, equations or a diagram.

- a. For a mobile land robot, give an example of a simple action, a task, and a behavior.
- b. Why is it usually best to avoid models, when possible?
- c. Which of the robot control architectures considered in the chapter tends to have the shortest “decide” step in the sense-decide-act paradigm? Explain why.
- d. Explain why a robot control architecture is necessary, especially in light of the fact that we have feedback control.

Exercise 04.2

Consider a mobile robot we would like to exhibit the behavior of wandering about an indoor environment with the usual walls, halls, obstacles, etc., covering as much of it as possible. It has three “bump” sensors, one in front and one on each side to detect when it hits a wall. The robot can drive forward, stop, and pivot. What are the possible states of the robot-environment system? Design a simple *reactive* controller that allows it to cover as much of the environment as possible move about without getting stuck. Be sure to specify the states that, when sensed, would be mapped each action, and the new states expected as the outcomes of each action. Furthermore, be sure to clarify any suppressions and/or inhibitions.

