

MC375:
lecture #2.

- *reading:*

Artificial Intelligence: A Modern Approach,
by Stuart Russell and Peter Norvig, 1995,
New Jersey: Prentice Hall.

Chapter 25: Robotics.

1/22/01 22:31

1

overview.

In this class, we will study and build

autonomous

mobile

robots

1/22/01 22:31

2

what is a robot?

"a programmable, multifunction manipulator designed to move material, parts, tools or specific devices through variable programmed motions for the performance of various tasks." (The Robot Institute of America)

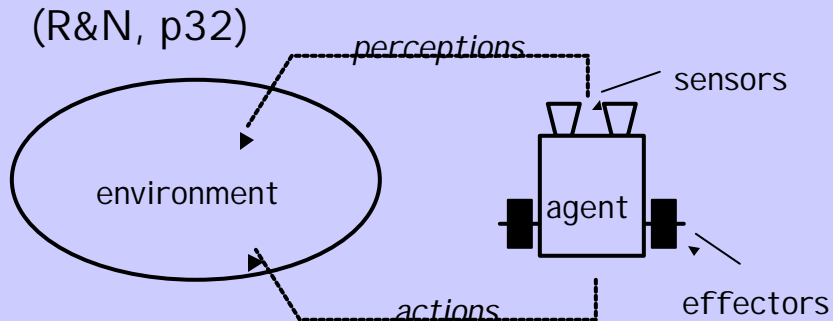
"an active, artificial agent whose environment is the physical world" (R&N, p773)

1/22/01 22:31

3

what is an agent?

"anything that can be viewed as perceiving its environment through sensors and acting upon that environment through effectors." (R&N, p32)



1/22/01 22:31

4

autonomy.

- no remote control!!
- an agent makes decisions *on its own*, guided by feedback from its sensors
- but --- you write the program that tells the agent how to make its decisions

1/22/01 22:31

5

environment.

- accessible vs inaccessible
- deterministic vs nondeterministic
- episodic vs non-episodic
- static vs dynamic
- discrete vs continuous

1/22/01 22:31

6

state.

- knowledge out oneself and one's environment
- example:
 - game board
- but one's environment is full of information
- for an agent, what is relevant?

1/22/01 22:31

7

effectors.

- \Rightarrow action
- *actuator*: converts software commands into physical motion
- locomotion vs manipulation
- statically stable vs dynamically stable
- holonomic vs nonholonomic

1/22/01 22:31

8

kinematics.

- study of correspondance between actuator mechanisms and resulting motion
- motion:
 - rotary
 - linear

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9

sensors.

- \Rightarrow perception
- *proprioceptive*: know where your joints/sensors are
- *odometry*: know where you are
- types:
 - force
 - tactile
 - sonar
 - camera
 - light

1/22/01 22:31

10