

# **CS344M**

# **Autonomous Multiagent Systems**

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The University of Texas at Austin

# Good Afternoon, Colleagues

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Are there any questions?

# Logistics

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- Questions about the syllabus?

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- Class registration

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- Next week's readings are up:
  - Brooks' reactive robots
  - A more deliberative architecture
  - RoboCup challenge paper

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  - RoboCup challenge paper
- Seating arrangement

# Thermostats

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- Are they agents or not?
- How does Wooldridge resolve this?

# Intelligent (autonomous) Agents

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  - Find me the cheapest?

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- Air-traffic controller
- Meeting scheduler
- Computer-game-playing agent

# Not Intelligent Agents

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- Thermostat
- Telephone
- Answering machine
- Pencil
- Java object

# Your Agent Examples

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**Simple** home alarm; cat food dispenser

**Software:** anti-virus/malware agent; spam filter; web crawler; iOS autocorrect daemon

**Automotive:** smart keys; digital highway speed sign; traffic light with sensors; autonomous car; cruise control

**Telecom:** GPS device; cell phone

**Physical Control:** Roomba; lawn watering system

**Health:** pacemaker

**Game/Entertainment:** chess player; first person shooter  
AI

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- You, as a class, act as a learning agent
- **Actions:** Wave, Stand, Clap
- **Observations:** colors, reward
- **Goal:** Find an optimal *policy*
  - Way of selecting actions that gets you the most reward

# How did you do it?

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- What is your policy?
- What does the world look like?

# Formalizing My Example

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Knowns:

# Formalizing My Example

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## Knowns:

- $\mathcal{O} = \{\text{Blue, Red, Green, Yellow, } \dots\}$
- Rewards in  $\mathbb{R}$
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$o_0, a_0, r_0, o_1, a_1, r_1, o_2, \dots$

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## Unknowns:

- $\mathcal{S} = 4 \times 3$  grid
- $\mathcal{R} : \mathcal{S} \times \mathcal{A} \mapsto \mathbb{R}$
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$$s_{i+1} = \mathcal{T}(s_i, a_i)$$