CS344M
Autonomous Multiagent Systems

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Good Afternoon, Colleagues

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- Pending questions:
  - Can an agent stop being an agent due to environment
  - Does it need to be persistent?
  - Is social ability essential?
  - What does "autonomy" mean?
  - How can you categorize discrete/continuous?

Logistics

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- 2D or 3D?

Self-Introductions

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- Name, year, major
- At least one other thing about yourself

Discussion

An autonomous agent is a system situated within and a part of an environment that senses that environment and acts on it, over time, in pursuit of its own agenda and so as to affect what it senses in the future.

- Is this a good definition?
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- Can you do better?
- Do they need to be social? persistent?
- Can they cease to be agents in a different environment?
- Autonomy

Varieties of Autonomy

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- What's Wooldridge's take on where autonomous agents lie on the spectrum?
  - Decide how to act so as to accomplish **delegated** goals
- Also mentions **adjustable** autonomy

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Autonomous Bidding, Cognitive Systems, Traffic management, **Robot Soccer**

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- single-agent vs. multiagent

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- learning?

Formalizing My Example

Knowns:

- $\mathcal{O} = \{$Blue, Red, Green, Black, $\ldots\}$
- Rewards in $\mathbb{R}$
- $\mathcal{A} = \{Wave, Clap, Stand\}$

$$\boxed{o_0, a_0, r_0, o_1, a_1, r_1, o_2, \ldots}$$

Unknowns:

- $\mathcal{S} =$ 4x3 grid
- $\mathcal{R} : \mathcal{S} \times \mathcal{A} \mapsto \mathbb{R}$
- $\mathcal{P} = \mathcal{S} \mapsto \mathcal{O}$
- $\mathcal{T} : \mathcal{S} \times \mathcal{A} \mapsto \mathcal{S}$

$$o_i = \mathcal{P}(s_i) \qquad r_i = \mathcal{R}(s_i, a_i) \qquad s_{i+1} = \mathcal{T}(s_i, a_i)$$

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Reactive agents for next Thursday's assignment task?

Discussion

What new autonomous agents do you expect to see in the next 10 years?