Autonomous Multiagent Systems

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Week 2, Thursday (9/5)

Administrative Stuff

- Mailing list
- Discussion list
- Final tournament date

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Any Questions?

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- pro-active vs. deliberative?
- agents vs. objects
- standard vs. state-based agent

Agents and Objects

- Autonomy
- Flexibility
- Own thread of control

Standard vs. State-based Agents

It is worth observing that state-based agents as defined here are in fact no more powerful than the standard agents we introduced earlier. In fact, the are *identical* in their expressive power.

- Standard agent: $action : \mathcal{S}^* \mapsto \mathcal{A}$

Example

- $\mathcal{S} = \{$Blue, Red, Green, Black$\}$
- $\mathcal{A} = \{1, 2, 3\}$
- $\mathcal{P} = \mathcal{S}$, $see(s) = s$
- $\mathcal{T} : \mathcal{S} \times \mathcal{A} \mapsto \mathcal{S}$ ($\mathcal{T}$ unknown to you)
- $\mathcal{R} : \mathcal{S} \times \mathcal{A} \mapsto \mathbb{R}$ ($\mathcal{R}$ unknown to you)

$$\boxed{s_0, p_0, a_0, r_0, s_1, p_1, a_1, r_1, s_2, \ldots}$$

- $p_i = see(s_i)$
- $r_i = \mathcal{R}(s_i, a_i)$
- $s_{i+1} = \mathcal{T}(s_i, a_i)$

Discrete? Accessible? Deterministic? Static? Episodic?

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Reactive Agents

- $action : \mathcal{P} \mapsto \mathcal{A}$
- Decision based entirely on the present

$\boxed{\text{Reactive agent for previous task?}}$

Multiagent Systems

- cooperative vs. competitive
- communication
- trust
- recursive modeling
- coalititions
- game theory

Convoy example

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