CS378
Autonomous Multiagent Systems
Spring 2004

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Week 7a: Tuesday, March 2nd

Good Afternoon, Colleagues

Are there any questions?

Logistics

- Project proposal questions?

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- Team lists, internet league

One more example project

- Communication in the soccer server

Class Discussion

Mustafa Ciftci on being ants

Continue ML crash course

- Genetic algorithms/programming
- **Neural networks**
- Reinforcement learning

Motivation from real insects

- Ant colonies exhibit remarkably complex behaviors
  - Food gathering
  - Burial
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Model the ant, not the colony

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- How does "altruism" arise?
- What does this mean about agent-based systems?
  - Should we create self-interested ants?
  - Or do we need to give them a global objective function?

Go to the Ant

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- Complexity comes from interactions, the environment

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Agents tied to environment

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Note: supports hierarchical agents

Examples from Nature

- Ants: path planning
- Ants: brood sorting
- Termites: nest building
- Wasps: task differentiation
- Birds and Fish: flocking
- Wolves: surrounding prey

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- Provide an "entropy leak"

Trail-Laying Robots

- An application to **real robots**
- Also use simulations

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- ...Do network routing
  - build routing table mapping destinations to links at each node
  - Goal: minimal transit time for packets

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- Missionaries and Cannibals – An optimization problem