CS344M
Autonomous Multiagent Systems
Spring 2008

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The University of Texas at Austin

Good Afternoon, Colleagues

Are there any questions?

Logistics

- Project proposal questions?

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- Faculty hiring talks start next week: T/R @ 11am

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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- 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

Principles

- Try to avoid functional decomposition
- Simple agents (small, forgetful, local)
- Decentralized control
- System performance from interactions of many
- Diversity important: randomness, repulsion
- Embrace risk (expendability) and redundancy
- Agents should be able to share information
- Mix planning with execution
- Provide an "entropy leak"

Class Discussion

Kevin Lai on swarms vs. non-swarms

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Trail-Laying Robots :

- An application to **real robots**
- Trails marked with a pen
  - Future options(?): odor, fluorescence
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Task Allocation :

- Also on real robots
- How many is too many?

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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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  - Analogy: ant burial

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- Character animation (Reynolds, Star Wars)