CS344M
Autonomous Multiagent Systems

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Good Afternoon, Colleagues

Are there any questions?
Logistics

- Project proposal questions?
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- Readings posted
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- AAMAS
Logistics

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- AAMAS
- Class midterm evaluation survey due next Thursday
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”
Propose an ant-based algorithm to
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Sort a dynamic set of items

- Each item has a key and a rank
- Goal: keep the ranks in ascending order of the keys
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Create ant cemeteries
- Goal: dead ants should all be piled in the same place
- (it doesn’t matter where)
Other ant-based research

- AntNet – Network routing solution
  - Randomized algorithm (packets sent probabilistically)
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- **AntNet** – Network routing solution
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- **Holland** – picking up pucks
  - Goal: robot putting pucks in a pile
  - Rules: move randomly, drop if you have 3
  - Analogy: ant burial
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- **Balch** – ant tracking
  - Computer vision success
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- **Missionaries and Cannibals** – An optimization problem
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- Character animation (Reynolds, Star Wars)
What evolves?

- In nature, is it the individual, the colony, or the gene?
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- How does “altruism” arise?
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- How does “altruism” arise?
- What does this mean about agent-based systems?
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- In nature, is it the individual, the colony, or the gene?
- 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?