CS344M
Autonomous Multiagent Systems

Todd Hester

Department of Computer Science
The University of Texas at Austin

Good Afternoon, Colleagues

Are there any questions?

Logistics

- Project proposal questions?

Logistics

- Project proposal questions?
- Readings posted

Logistics

- Project proposal questions?
- Readings posted
- AAMAS

Logistics

- Project proposal questions?
- Readings posted
- 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

-

Propose an ant-based algorithm to

- Sort a dynamic set of items
  - Each item has a key and a rank
  - Goal: keep the ranks in ascending order of the keys

Propose an ant-based algorithm to

- Sort a dynamic set of items
  - Each item has a key and a rank
  - Goal: keep the ranks in ascending order of the keys

- 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)

Other ant-based research

- AntNet – Network routing solution
  - Randomized algorithm (packets sent probabilistically)

- Holland – picking up pucks
  - Goal: robot putting pucks in a pile
  - Rules: move randomly, drop if you have 3
  - Analogy: ant burial

Other ant-based research

- AntNet – Network routing solution
  - Randomized algorithm (packets sent probabilistically)

- Holland – picking up pucks
  - Goal: robot putting pucks in a pile
  - Rules: move randomly, drop if you have 3
  - Analogy: ant burial

- Balch – ant tracking
  - Computer vision success

Other ant-based research

- AntNet – Network routing solution
  - Randomized algorithm (packets sent probabilistically)

- Holland – picking up pucks
  - Goal: robot putting pucks in a pile
  - Rules: move randomly, drop if you have 3
  - Analogy: ant burial

- Balch – ant tracking
  - Computer vision success

- Missionaries and Cannibals – An optimization problem

Other ant-based research

- AntNet – Network routing solution
  - Randomized algorithm (packets sent probabilistically)

- Holland – picking up pucks
  - Goal: robot putting pucks in a pile
  - Rules: move randomly, drop if you have 3
  - Analogy: ant burial

- Balch – ant tracking
  - Computer vision success

- Missionaries and Cannibals – An optimization problem

- Character animation (Reynolds, Star Wars)

What evolves?

- In nature, is it the individual, the colony, or the gene?

What evolves?

- In nature, is it the individual, the colony, or the gene?
- How does "altruism" arise?

What evolves?

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

What evolves?

- 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?