# CS378
# Autonomous Multiagent Systems
# Spring 2004

**Prof: Peter Stone**
**TA: Mazda Ahmadi**

Department of Computer Sciences
The University of Texas at Austin

Week 4b: Thursday, February 12th

# Good Afternoon, Colleagues

Are there any questions?

# Good Afternoon, Colleagues

Are there any questions?

- Sycara: "No system global control"
- Recent uses of MAS?
- Evolutionary agents?
- How does distributed negotiation scale?

# Job Information Part II

BEHAVIOR-BASED INTERVIEWING
How to Get a Job: Part 2
presented by Jacqueline Ford
sponsored by Women in Computer Sciences

DATE: Tuesday, Feb. 17 AND Wednesday, Feb. 18
TIME: 7:00 PM
PLACE: PAI 3.14
ADMISSION: $5 general / free for WICS members

Bring Interview Questions that Stump You!

# Logistics

- Please give page numbers (or something) in your questions/comments about the readings

# Logistics

- Please give page numbers (or something) in your questions/comments about the readings
- Programming assignment 4 - any questions?

# Logistics

- Please give page numbers (or something) in your questions/comments about the readings
- Programming assignment 4 - any questions?
- Pending talks:
  - Illah Nourbakhsh: personal rovers
  - Rosaline Picard: emotional intelligence
  - Rob Holte: poker

# Logistics

- Please give page numbers (or something) in your questions/comments about the readings
- Programming assignment 4 - any questions?
- Pending talks:
  - Illah Nourbakhsh: personal rovers
  - Rosaline Picard: emotional intelligence
  - Rob Holte: poker
- Orchestra (as a MAS)

# Class discussion

Jan Ulrich with an activity

# Mataric: Adaptive Group Behavior

- Built using subsumption architecture
- More complex behaviors than in Brooks' article
  - Multiagent

# Basis Behaviors

- Necessary and sufficient, not "optimal"

# Basis Behaviors

- Necessary and sufficient, not "optimal"
  - Task dependent
  - Combinations: complementary, contradictory

# Basis Behaviors

- Necessary and sufficient, not "optimal"
  - Task dependent
  - Combinations: complementary, contradictory
- Example: locomotion

# Basis Behaviors

- Necessary and sufficient, not "optimal"
  - Task dependent
  - Combinations: complementary, contradictory
- Example: locomotion
  - Safe-wandering, following, dispersion, aggregation, homing

# Basis Behaviors

- Necessary and sufficient, not "optimal"
  - Task dependent
  - Combinations: complementary, contradictory
- Example: locomotion
  - Safe-wandering, following, dispersion, aggregation, homing
  - Purely reactive? (in either sense)

# Basis Behaviors

- Necessary and sufficient, not "optimal"
  - Task dependent
  - Combinations: complementary, contradictory
- Example: locomotion
  - Safe-wandering, following, dispersion, aggregation, homing
  - Purely reactive? (in either sense)
  - Anything special about this domain? Or could it apply just as well to others?

# Conflicts, Resources

- Omniscience for one agent creates bottleneck

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)
  - Pitfall: tragedy of the commons

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)
  - Pitfall: tragedy of the commons
  - Pitfall: no stability

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)
  - Pitfall: tragedy of the commons
  - Pitfall: no stability
  - Pitfall: lying

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)
  - Pitfall: tragedy of the commons
  - Pitfall: no stability
  - Pitfall: lying
- Market-based methods/auctions

# Conflicts, Resources

- Omniscience for one agent creates bottleneck
- Self-interested agents: each agent maximizes own local utility
  - Good for global performance?(invisible hand)
  - Pitfall: tragedy of the commons
  - Pitfall: no stability
  - Pitfall: lying
- Market-based methods/auctions
- Negotiation, game theory

# Negotiation

- Example: Split the dollar
  - One person makes an offer
  - Other accepts or rejects
  - If rejects, both get nothing

# Negotiation

- Example: Split the dollar
  - One person makes an offer
  - Other accepts or rejects
  - If rejects, both get nothing
- Another version
  - One person makes an offer
  - Other accepts, rejects, or counters
  - If counters, $.05 lost
  - Game ends with an accept or reject