CS344M
Autonomous Multiagent Systems

Todd Hester

Department of Computer Science
The University of Texas at Austin
Good Afternoon, Colleagues

Are there any questions?
Logistics

- Next week’s readings
Logistics

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- Progress reports due just over 2 weeks
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Surveys

- Readings:
  - Mostly good, some mixed reviews
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  - Tips of what to get from the reading
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• Writing
  – Most like reading responses
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  – “By making us think about the readings, either through specific questions or through free-responses, the writing exercises help us to get more involved with the readings.”
“They help me reaffirm my understanding of the reading, and in that sense they are helpful”
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  - Discussion format good
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My takeaways

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- Discussion - Give better initiating questions
- Activities - More activities getting you designing solutions
- Machine learning - More tutorials on machine learning
- C/C++ help - More advice and specific documentation
Game Theory

- Multiagent systems
- Economics
- Social science, law, etc.
Goals for Today

- Understand premises of game theory
- Understand the notion of *utility*
- Understand solution concepts
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- Understand premises of game theory
- Understand the notion of utility
- Understand solution concepts
  - Dominant strategy
  - Nash equilibrium
  - Pareto optimality
  - Maximum social welfare
  - Maximin strategy
## Prisoner’s Dilemma

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Game Theory Premises

- Simultaneous actions
- No communication
- Outcome depends on combination of actions
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- Outcome depends on combination of actions
- Utility (payoff) encapsulates everything about preferences over outcomes
Utility

- Money is a useful analogy for utility
  - But they’re not equivalent
Utility

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- Diminishing values
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Utility

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- Diminishing values
- Risk aversion
- Loss aversion
- Friendliness/vindictiveness
Solution Concepts

• Dominant strategy
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- Nash equilibrium
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### Chicken

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Discussion

- How would you design an agent to play iterated prisoner’s dilemma?
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- What if you could submit up to 10 entries to the tournament?
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- What is your strategy if you are playing only one game with a stranger, but can communicate first?
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• What is your strategy if you are playing only one game with a stranger, but can communicate first?
## Split or Steal

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