CS344M
Autonomous Multiagent Systems

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Good Afternoon, Colleagues

Are there any questions?

Logistics

- Next week's readings

Logistics

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- Class Survey (21 as of this morning)
- Talks in the department:
  - Patrick MacAlpine, PhD Proposal, Wednesday at 2:30pm (GDC 4.816) "Multilayered Skill Learning and Movement Coordination for Autonomous Robotic Agents in Spatial Domains"

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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  - Dominant strategy
  - Nash equilibrium
  - Pareto optimality
  - Maximum social welfare
  - Maximin strategy

Prisoner's Dilemma

		Column	
		C(1)	D(2)
Row	C(1)	3,3	0,5
	D(2)	5,0	1,1

Game Theory Premises

- Simultaneous actions
- No communication
- Outcome depends on **combination** of actions

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

Utility

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  - But they're not equivalent
- Diminishing values
- Risk aversion
- Loss aversion
- Friendliness/vindictiveness

Solution Concepts

- Dominant strategy

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Prisoner's Dilemma

		Column	
		C(1)	D(2)
Row	C(1)	3,3	0,5
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Chicken

		Column	
		C(1)	D(2)
Row	C(1)	3,3	1,5
	D(2)	5,1	0,0