CIS 410/510 (Spring 2019): Multi-Agent Systems and Real-world Applications Final Review

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Final Exam

- Location and date: 122 MCK, 06/13/2019 at 2:45pm
- Approximately ~120 minutes
- Closed book
- One-page cheat sheet
Covered Topics

- Normal-Form Games
- Extensive-Form Games
- Security Games
- Behavioral Game Theory
- Multi-Agent Learning
Normal-Form Games

- Strategy dominance
- Iterated dominance
- Nash equilibrium
Normal-Form Games

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<tr>
<th>Player 1</th>
<th>Player 2</th>
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<tbody>
<tr>
<td>Paper</td>
<td>Paper</td>
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<tr>
<td></td>
<td>Rock</td>
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<td>Scissors</td>
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Extensive-Form Game

- Extensive form representation

- Sub-game perfect equilibrium
Security Games

- Strategies
  - Mixed strategies
  - Compact representation
  - Sampling joint schedule

- Strong Stackelberg equilibrium

- ORIGAMI
Behavioral Game Theory

- BRASS: address bounded rationality
  - epsilon:

- GUARD: address observation uncertainty
  - Anchoring bias

- Quantal Response:
  - Lambda

- Prospect Theory
Multi-Agent Learning

- Markov Decision Process (MDP)
  - Optimal policy

- Reinforcement learning
  - q-learning
  - Exploration: epsilon-greedy, exploration function
Markov Decision Process

- Start state: A
- $r(A) = 3$, $r(C) = 5$, $r(D) = 10$, $\gamma = 0.5$
- $r(B) = 1$
- $r(B) = -10$