Reading Questions

Monday, September 10th 2012

Preamble

Reading questions must be answered before each class to receive full participation credit. Attempt to give each question a good faith answer. Use the course website to submit your answers (you have to request a username from the course TF before you'll be able to post).

These questions are designed to facilitate discussion, so don't hesitate to expand or comment on other parts of the reading you thought were interesting.

1 Multiagent Systems questions

For those who didn't take CS 286r last year.

1.1 Russell Crowe's equilibrium

In the movie "A Beautiful Mind," Russell Crowe plays John Nash and appears to discover Nash equilibrium while out dancing with some friends. He and his four (male) friends are discussing how to approach a group five women. Each man is interested in the same pretty blonde girl, but Crowe (as Nash) argues,

> If we all go for the blonde and block each other, not a single one of us is going to get her. So then we go for her friends, but they will all give us the cold shoulder because no on likes to be second choice. But what if none of us goes for the blonde? We won't get in each other's way and we won't insult the other girls. It's the only way to win.

1. Accepting Nash's logic, is his proposed strategy profile a Nash equilibrium? Why or why not?
2. Are there Nash equilibrium of this game? Describe one.
3. Do we have enough information to identify a mixed strategy Nash equilibrium? What more would we need to know?

1.2 Extensive-form games

1. Describe a real-world problem that might be modeled as a perfect information extensive-form game.

2. If two people sit down to play the Prisoner's Dilemma five times in a row ...

   what does backwards induction tell us they'll do in Nash equilibrium?

   what if they play an infinite number of times instead of five?

   what do you think happens in real life when people play the Prisoner's Dilemma five times? What about 20 times?

2 Algorithmic Game Theory questions

For those who want to read something new.

2.1 Cost of Anarchy

1. In your own words, what is the cost of anarchy? What is the price of stability?

2. What's a real-world setting that might have a high cost of anarchy?

3. If the cost of anarchy is near one, does that imply the game or network or etc. is in some sense "good" or "desirable?"