# 16.412J Advanced Lecture Schedule

# Spring, 2005

## Student Advanced Lectures

- **M March 28:** Planning with POMDPs
  by Brian Bairstow, Tony Jimenez, Larry Bush

- **W March 30:** Model-based, Multi-Agent Reasoning in Texas Holdem Poker
  by Brian Edward Mihok, and Michael Terry

- **M April 4:** Cognitive Game Theory
  by Justin Fox, Jeremie Pouly, and Jennifer Novosad

- **W April 6:** Mode Estimation for Hybrid Discrete/Continuous Systems
  by Lars Blackmore
  *Topics: Trajectory Tracking for Constraint-based HMMs,
  Gaussian Filtering for Hybrid HMMs
  (K-Best and Rao-Blackwell Particle Filtering)..*

- **M April 11:** Particle Filters and their Applications
  by Kaijen Hsiao, Jason Miller, Henry Lefebvre de Plinval-Salgues

- **W April 13:** Intentional Learning and Recognition in Human-Robot Interaction
  by Shuonan Dong, Shen Qu, Thomas Coffee

- **M April 18:** Patriots Day Vacation

- **W April 20:** Advanced Topics in Bayesian Networks
  by Tom Temple, Ethan Howe, and James Lenfestey

# Advanced Guest Lectures

### Sensing and Manipulating at the Cognitive Level

- **M April 25:**   Visual Interpretation using Probabilistic Grammars
  by Paul Robertson

- **W April 27:**   Robust, Task-level Execution for Humanoid Robots
  by  Andreas Hoffman

### Human – Robot Interaction

- **M May 2:**   Social Robotics: Facilitating dialogue via social queues
  by Cynthia Brezeal

- **W May 4:**   Nursebot: dialogue as a decision making process
  by Nick Roy

# Final Project Reports

- **W May 9:**   Project Demonstrations: ~ 10 minute per student presentations

- **W May 11:**   Project Demonstrations: ~ 10 minute per student presentations.
  *Final project reports due by end of day*

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Hi Brian,
In my previous email to Justin Fox, I mentioned that it would be great to present back-to-back lectures involving related, but complementary topics, since we are both interested in reasoning in the realm of games.

In our lecture, we would like to present a model-based approach to reasoning about adversarial agents. From my own experience, I know that in poker most opponents can be modeled into one of a few categories based upon sampled data from previously played hands(training data), and only a few new observations from a given opponent. Brian and I have talked about fitting this into some kind of framework for model-based reasoning, and present this information and relevant background research to the class. We realize this is a VERY hard problem, and we hope to take a very aggressive chunk of it to address in our final project.

Title: Model-based, Multi-Agent Reasoning in Texas Holdem Poker
Preference for Dates:
1. first pair (March 28, 30)
2. second pair (April 6, 11)
3. third pair (April 13, 20)

We would obviously appreciate any feedback or criticism along the way.

Have a great weekend.

  Mike and Brian

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Dear Brian,

Sorry this email is so late. I will be on Justin Fox's lecture team, talking about game theory. I would personally like to be in the second group of lectures. Our team hasn't gotten the chance to talk together yet, so I'm not sure what the other members prefer, or what the exact title is.

thank you,
Jennifer

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- I have made arrangements to work with Shen and Shuonan on the topic of intentional learning/recognition in human-robot interaction.

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To: 16.412J-students@MIT.EDU
Subject: 16.412 Advanced lecture - games


Hi there!

Jeremie Pouly and I are planning to do an advanced lecture on games and game theory.  We're looking for a third person.  If anyone would be interested in joining up, feel free to let us know!  Thanks!

-Justin Fox

To: "'Justin M Fox'" <foxj@mit.edu>, <jpouly@mit.edu>
Cc: "'Brian E. Mihok'" <mihok@mit.edu>, <williams@mit.edu>
Subject: RE: 16.412 Advanced lecture - games

Justin and Jeremie,
Brian Mihok and I are also presenting on a topic related to reasoning and games and/or game theory.  I'm sure the focus of our presentations will be vastly different, but it would be nice if we could complement each other's work in successive lectures, presenting a coherent stream of information to the class.  My impression this point is that we will be looking at issues related to multi-agent environments, and reasoning about situations based upon inferred models of those agents and unknown state information.  We are in the early phases of understanding the key concepts ourselves, but my impression is that there is a really good chance this will be close to the thrust of our presentation.

As I mentioned in class, the game we are looking to use as a demonstration is Texas Holdem Poker.

If you would like to meet to talk further, I work in the Stata Center.

Also, Brian and I would prefer to present as early as possible in the schedule.  Let us know if you would like to meet to discuss this further.

Mike