

Probabilistic Models of Cognition: The Mathematics of Mind

Monday January 24, 2005

- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00–9:30 *Welcome and Opening Remarks*
- 9:30 *Vision*
- 9:30–10:30 **Dan Kersten** (University of Minnesota)
Human Object Perception as Bayesian Inference
- 10:30–10:45 *Discussion*
- 10:45–11:15 *Break*
- 11:15–12:15 **Paul Schrater** (University of Minnesota)
Natural cost functions for contact point selection in grasping
- 12:15–12:30 *Discussion*
- 12:30–2:00 *Lunch (on your own)*
- 2:00 *Memory/Cognitive Architecture*
- 2:00–3:00 **Rich Shiffrin** (University of Indiana)
Bayesian-based models for perception and memory: ROUSE and REM
- 2:00–3:00 **David Huber** (University of Maryland)
Bayesian-based models for perception and memory: ROUSE and REM
- 3:00–3:15 *Discussion*
- 3:15–3:45 *Break*
- 3:45–4:45 **Mark Steyvers** (University of California at Irvine)
Probabilistic topic models and associative memory
- 4:45–5:00 *Discussion*
- 5:00–5:30 *Break*
- 5:30 *Associative Learning*
- 5:30–6:30 **Peter Dayan** (Gatsby)
(Approximately) Optimal Models of Animal Conditioning
- 6:30–6:45 *Discussion*
- 6:45–7:45 *Wine/Cheese Reception (Hosted by IPAM)*



Tuesday January 25, 2005

- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00 *From Associative Learning to Causal Inference*
- 9:00–10:00 **Aaron Courville** (Carnegie Mellon University)
A latent variable account of configural conditioning
- 10:00–10:15 *Discussion*
- 10:15–10:45 *Break*
- 10:45–11:45 **Judea Pearl** (UCLA)
The Mathematics of Causal Modeling
- 11:45–12:00 *Discussion*
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 **Patricia Cheng** (UCLA)
A Probabilistic Representation of Causation: Some Implications
- 2:30–2:45 *Discussion*
- 2:45–3:15 *Break*
- 3:15–4:15 **Alan Yuille** (UCLA)
Image Parsing and DDMCMC
- 4:15–4:30 *Discussion*
- 4:30–5:00 *Break*
- 5:00–6:00 **Tom Griffiths** (Brown University)
Theory-Based Causal Induction
- 6:00–6:15 *Discussion*

Wednesday January 26, 2005

- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00 *Concepts and Categorization*
- 9:00–10:00 **Jacob Feldman** (Rutgers University)
Detecting simple patterns in featural data
- 10:00–10:15 *Discussion*
- 10:15–10:45 *Break*

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- 10:45–11:45 **Josh Tenenbaum** (Massachusetts Institute of Technology)
- 11:45–12:00 *Discussion*
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 **David Danks** (Carnegie Mellon University)
Graphical Models for Psychological Categorization
- 2:30–2:45 *Discussion*
- 2:45–3:15 *Break*
- 3:15 *Structure in Probabilistic Models*
- 3:15–4:15 **Eric Mjolsness** (University of California at Irvine)
Variable-Structure Probabilistic Models
- 4:15–4:30 *Discussion*
- 4:30–5:00 *Break*
- 5:00–6:00 **Stuart Russell** (University of California at Berkeley)
Uncertainty in an unknown world
- 6:00–6:15 *Discussion*
- 6:15–7:30 *Dinner (Hosted by IPAM)*

Thursday January 27, 2005

- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00 *Motor Systems*
- 9:00–10:00 **Daniel Wolpert** (Sobell Dept. of Motor Neuroscience)
Probabilistic mechanisms in sensorimotor control
- 10:00–10:15 *Discussion*
- 10:15–10:45 *Break*

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- 10:45–11:45 **Emanuel Todorov** (University of California at San Diego)
On the interplay of noise and redundancy in the motor system
- 11:45–12:00 *Discussion*
- 12:00–1:30 *Lunch (on your own)*
- 1:30 *Planning, Decision Making, and Imitation*
- 1:30–2:30 **Brian Stankiewicz** (University of Texas, Austin)
The role of belief updating in human sequential decision making with uncertainty
- 2:30–2:45 *Discussion*
- 2:45–3:15 *Break*
- 3:15–4:15 **Michael Lee** (University of Adelaide)
A generative model of human performance on an optimal stopping problem
- 4:15–4:30 *Discussion*
- 4:30–5:00 *Break*
- 5:00–6:00 **Rajesh Rao** (University of Washington)
A Bayesian Model of Sensorimotor Learning and Imitation in Infants and Robots
- 6:00–6:15 *Discussion*

Friday January 28, 2005

- 8:30–9:00 *Check-In/Light Breakfast (Hosted by IPAM)*
- 9:00 *Language*
- 9:00–10:00 **Nick Chater** (University of Warwick)
Statistical Language Learning: Analysis of an 'Ideal' Language Learner
- 10:00–10:15 *Discussion*
- 10:15–10:45 *Break*

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- 10:45–11:45 **Chris Manning** (Stanford University)
Learning the Structure of Human Languages
- 11:45–12:00 *Discussion*
- 12:00–1:30 *Lunch (on your own)*
- 1:30–2:30 **Frank Keller** (University of Edinburgh)
Probabilistic Models of Human Sentence Processing
- 2:30–2:45 *Discussion*
- 2:45–3:15 *Break*
- 3:15–4:15 **Adam Albright** (Massachusetts Institute of Technology)
Modeling competition and uncertainty in word class decisions
- 4:15–4:30 *Discussion*
- 4:30–5:00 *Break*
- 5:00–6:00 *Summary Discussion*

