

Beliefs and decisions: of minds and machines

CEU SUMMER UNIVERSITY

July 5-9, 2010

Bibliography

Pre-course readings follow the organisation of the course by introducing participants to key themes, theories and concepts in each of three module areas.

Module I. Representations of uncertainty

- Jaynes ET. Probability Theory: The Logic of Science. Cambridge University Press, Cambridge, UK, 2003 (selected chapters).
- MacKay DJC. Information theory, inference, and learning algorithms. Cambridge University Press, Cambridge, UK, 2003 (selected chapters).
- Pouget A, Dayan P, Zemel RS. Inference and computation with population codes, Annual Review of Neuroscience, 26: 381-410, 2003.

Reading guide:

What are the basic rules of probability? How can probability distributions be represented in neural activity?

Module II. Learning

- Ghahramani Z. Unsupervised learning. In Bousquet O et al. Advanced Lectures in Machine Learning. Lecture Notes in Computer Science 3176, 72-112. Springer-Verlag, Berlin, 2004.
- Wolpert DM, Ghahramani Z. Computational motor control. In Gazzaniga MS. The Cognitive Neurosciences III, 485-494, MIT Press, Cambridge, MA, 2004.
- Dayan P, Abbott LF. Theoretical Neuroscience. MIT Press, Cambridge, MA, 2001 (selected chapters).

Reading guide:

How can learning be interpreted as probabilistic inference? What are the hallmarks of probabilistic learning in motor control and vision?

Module III. Decision making

- Glimcher PW et al. Neuroeconomics: Decision Making and the Brain. Academic Press, London, UK, 2008. (selected chapters)
- Sutton RS, Barto AG. Reinforcement Learning. MIT Press, Cambridge, MA, 1998. (selected chapters)

Reading guide:

What are the key decision theoretic quantities that have been shown to be represented in neural activity? How does game theory relate to decision making?