HPS/Pl 122: Probability, Evidence & Belief
California Institute of Technology
Spring 2018

Instructor: Boris Babic
Email: bbabic@caltech.edu
Office: **B118 Dabney**

Time: T/Th 2:30-4pm
Location: Dab 117
Office Hours: T 1-2:30pm

Course Description

This course will be an advanced research level seminar in Bayesian or probabilistic epistemology. Bayesian epistemology adopts a decision theoretic perspective to the selection and assessment of belief states. In this sense, it finds applications in philosophical analysis, economic theory, and statistical decision theory. We will read recent papers on probabilism, conditioning, accuracy, calibration, symmetry, (in)coherence, priors, information entropy, convergence, and other recent topics in the field.

The aim of the course is to sharpen your ability to reason analytically about complex and difficult problems from a decision-theoretic perspective.

I will not presuppose any background in philosophy. Rather, the course is advanced in the sense that we will work through challenging recent scholarship rather than learning from a textbook or anthology. While there are no prerequisites, some of the readings will require a strong background in probability and statistics. If you are worried about your prior mathematical background, speak to me in advance and I will recommend some remedial literature.

Materials

I will post all course readings to Moodle. No textbook is required.

Assignments

Two 2000-3000 word essays (**30%** each), presentation (**20%**), and class participation (**20%**).

Deadlines: First essay: Tuesday May 8 in class. Second essay: Thursday May 31 (for graduating seniors), Thursday June 7 (everyone else).

Schedule

04/03 **Introduction: The Structure of Belief**
No required reading.

04/05 **Pragmatic Arguments for Probabilism**
Ramsey (1926): Truth and Probability (excerpts)

04/10 **Non-Pragmatic Arguments for Probabilism**
Joyce (1998): Non-Pragmatic Vindication of Probabilism

04/12 **More General Non-Pragmatic Arguments for Probabilism**
Joyce (2009): Prospects for an Alethic Epistemology of Partial Belief

04/17 **Pragmatic Arguments for Conditionalization**
Teller (1973): Conditionalization and Observation
Lewis (1999): Papers in Metaphysics & Epistemology (excerpts)

04/19 **Non Pragmatic Arguments for Conditionalization**
van Fraassen (1984): Belief and the Will
Greaves and Wallace (2006): Conditionalization Maximizes Exp. Epistemic Utility

04/24 **Objections to Conditionalization and Reflection**
Arntzenius (2003): Some Problems for Conditionalization and Reflection
Briggs (2009): Distorted Reflection
Schoenfield (2018): Conditionalization Does Note (in general) Max Exp. Accuracy
Lewis and Fallis (2016): Problems with Accuracy and Conditionalization

04/26 **Martingales and Defense of Reflection**
Huttegger (2013): In Defense of Reflection
Babic (Draft): Dynamic Epistemic Risk

05/01 **Information Entropy**
Shannon (1948): A Mathematical Theory of Communication (Excerpts)
Mackay (2003): Information Theory (Excerpts)

05/03 **Objective Bayes**
Jaynes (2003): Probability Theory (excerpts)
Williamson (2010): In Defense of Objective Bayesianism (Excerpts)

05/08 **Epistemic Risk**
Babic (2018): A Theory of Epistemic Risk
Horowitz (2018): Epistemic Value and the Jamesian Goals
Levinstein (2017): Permissive Rationality and Sensitivity

05/10 **Evidence Gathering**
Buchak (2010): Inst. Rationality, Epistemic Rationality and Evidence Gathering
Campbell-Moore/Salow (2018): Avoiding Risk and Avoiding Evidence
Fallis (2007): Attitudes Toward Epistemic Risk and the Value of Experiments

05/15 **Conflicting Updates**
van Fraassen (1981): A Problem for Relative Information Minimizers
Grove and Halpern (1997): Probability Update
Vasudevan (2018): Deceptive Updating

05/17 **Selection of Priors**
Jaynes (1963): Brandeis Lectures
Jaynes (2003): Probability Theory (Excerpts)
Pettigrew (2014): Accuracy, Risk, and the Principle of Indifference

05/22 **Approximate Coherence**
Staffel (2017): Graded Incoherence for Accuracy Firsters
Staffel (2018): Why be Approximately Coherent

05/24 **Objections to Approximate Coherence**
Babic (Draft): A Challenge for Approximate Coherentism

05/29 **Bayesian Convergence: Topology vs. Measure Theory**
Belot (2013): Bayesian Orgulity
Diaconis (1986): On the Consistency of Bayes Estimates

Kelly/Glymour (1989): Conv. to The Truth and Nothing but the Truth

05/31 **Bayesian Convergence: Further Reflections**
Huttegger (2015): Bayesian Convergence to the Truth
Pomatto (2018): An Axiomatic Theory of Inductive Inference

06/05 **Stepping Back, Part 1**
Gibbard (2008): Rational Credence and the Value of Truth
Blackwell/Drucker (2017): When Propriety is Improper

06/07 **Stepping Back, Part 2**
Carr (2018): Epistemic Utility Theory and the Aim of Belief

Attendance and reading

Engaged participation is an important component of this class and I expect everyone to contribute meaningfully to class discussion. This does not mean I will reward those who speak most. And it does not mean you cannot do well on the participation component if you're less comfortable speaking up. Learning to articulate your thoughts in a professional, courteous and persuasive manner is an invaluable skill and a goal of this course is to improve your ability to do this.

While the readings are not long, they can be very difficult. As a result, you should plan to spend a fairly significant amount of time reading and re-reading the material.

Submitting assignments and Late policy

All papers must be submitted in hard-copy in class on the day they are due.

If you anticipate needing more time on an assignment, you should contact me in advance. Otherwise, late assignments will be penalized by one-third of a letter grade for each day they are late.

Students with disabilities

If you think you may need accommodation for a disability, please let me know as early as possible.

Plagiarism

Written work submitted for a grade in this course must be your own. You are responsible for making sure that none of your work is plagiarized. You should cite the sources you rely on, and err on the side of caution where necessary. Feel free to consult me if you are not sure of the appropriate format for quotations or references.

More information on plagiarism is available on the Hixon Writing Center's website:
www.writing.caltech.edu/students/plagiarism.