Formal Methods II: Models and Simulations

Munich Center for Mathematical Philosophy

Summer 2020

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Description

Much of the focus in traditional epistemology is on knowledge and justified belief for an individual agent. This course, by contrast, looks at a range of issues that arise for *groups* of epistemic agents, such as how groups communicate with one another and how and when groups achieve consensus. We will also consider epistemic issues for individuals that are especially salient in social contexts, such as how to evaluate expert testimony and how to respond to peer disagreement.

Social epistemology uses a variety of different methodologies, some not typically employed in traditional epistemology. This course is as much about introducing students to some of those methodologies as it is about introducing students to a particular set of topics in epistemology. In particular, this course will introduce students to the use of agent-based computer models (ABMs) in social epistemology. Specifically, students will learn how to program in NetLogo, a programming language and simulation environment designed for ABMs. No previous programming experience is required.

Lectures and Readings

Even more than usual, we will make use of Coursesites. All articles and excerpts for the class will be made available there. Any relevant handouts will also be posted. It's likely that some portions of lectures will be recorded and posted there as well. For at least the beginning of the term, we will be holding class meetings via Zoom. There will be a separate programming tutorial.

Software

We will be using NetLogo, which can be downloaded at https://ccl.northwestern.edu/netlogo/.

Requirements

The central requirement is to design and implement an ABM for the purpose of addressing a question of current interest in social epistemology. Students will write a final paper that (i) describes the question that model is intended to answer and (ii) the results obtained from the model by computer simulations. Each student must submit a detailed proposal (about three pages) of his or her final project after two months.

There will also be programming assignments due almost every week for the first several weeks of the course. Assignments are due at the time of the tutorial. One cannot learn to program without practicing regularly. The weekly assignments are designed to help you practice the

skills required to design an ABM to address problems in social epistemology that will be discussed in lecture. Papers should be around 2,500 to 3,000 words (very roughly).

Grading

Programming Assignments:	30%
Proposal:	20%
Final Paper Project:	50%

Coursesites

To access materials and submit programming assignments, students must register for *Formal Methods II: Models and Simulations* on Coursesites. Request to enroll at https://tinyurl.com/ydypa9r8.

Schedule

It is likely that the schedule will be adjusted throughout the term. There is some room to tailor our schedule to the interests of the class. Updates will be posted to Coursesites.

Date	Topic	Assignments
	Introduction to Social Epistemology	
20.04	Intoductory remarks, organization	
27.04	"Systems-Oriented Social Epistemology," Goldman	
	Disagreement	
04.05	**Introduction to Peer Disagreement** "Reasonable Religious Disagreements," Feldman "Peer Disagreement and Higher Order Evidence," Kelly "Reflection and Disagreement," Elga	PA 1 Due
11.05	**Is Rational Disagreement Possible?** "Agreeing to Disagree," Aumann "When Rational Disagreement Is Impossible," Lehrer	PA 2 Due
18.05	**Agent-Based Models (ABMs) of Peer Disagreement** "Naive Learning in Social Networks and the Wisdom of Crowds," Golub and Jackson "Simulating Peer Disagreements," Douven	PA 3 Due
	Testimony	
25.05	**Testimonial Justice** "Credibility and the Distribution of Epistemic Goods," Lackey "On the Possibility of Testimonial Justice," Stewart and Nielsen Optional: *Epistemic Injustice*, ch. 1, Fricker	
01.06	Whit Monday, No Class	
08.06	**ABMs and Testimony** "The Communication Structure of Epistemic Communities," Zollman "Reliability and Testimonial Norms in Scientific Communities," Mayo-Wilson	PA 4 Due

15.06	**ABMs of Communication in Science** "The Epistemic Benefit of Transient Diversity," Zollman "Robustness and Idealizations in Agent-Based Models of Scientific Interaction," Frey and Šešelja Optional: "The Independence Thesis: When Individual and Social Epistemology Diverge," Mayo-Wilson et al.	PA 5 Due
	DIVERSITY	
22.06	**Individual vs. Group Rationality and Reward Schemes in Science** "Objectivity, Value Judgment, and Theory Choice," Kuhn "The Division of Cognitive Labor," Kitcher	
29.06	No class	
06.07	**Methodological Pluralism and Standpoint Theory** "Standpoint Matters," Wylie "Theoretical Pluralism and the Scientific Study of Behavior," Longino	PA 6 Due
13.07	**ABMs of Diversity in Research Methodology** "Epistemic Landscapes and the Division of Cognitive Labor," Weisberg and Muldoon Optional: "Groups of Diverse Problem Solvers Can Out-Perform Groups of High-Ability Problem Solvers," Hong and Page	
	INFORMATION CASCADES	
20.07	"A Simple Model of Herd Behavior," Banerjee Optional: "Information Cascades: Replication and an Extension to Majority Rule and conformity-rewarding institutions," Hung and Plott	