Building Better Epistemic Networks – Titles and abstracts

Kate Devitt

Building epistemic virtues in communities with an evidence-based digital-physical social network

This paper examines how to build epistemic virtues in a digital-physical social network of diverse users. I discuss the virtue-Bayesian epistemic architecture of social platform BetterBeliefs in conjunction with explicit community management to ensure psychological safety. The BetterBeliefs platform rewards users who demonstrate epistemically virtuous behaviours and exports evidence-based propositions for decision-making. I examine the use of the platform to build a normative epistemic community (diverse, representative, expert) around the topic of ethical AI including academics, government, non-profit and industry. Participants were challenged to engage online on the platform before, during and after a physical workshop: adding hypotheses, voting hypotheses up and down, adding supporting and refuting evidence and ranking evidence items. The aim of the platform is to provide an community-based online collaboration tool to counter the dominant mode of social network transmission where emotions (particularly anger and outrage) are most viral and evidence-based argument may not be surfaced. But, also to challenge existing models of information sharing at workshops and conferences. Physical workshops can reward dominant personalities over evidence-based ideas. Conferences produce a volume of papers (in the best case scenario) written largely in isolation from community and can lack impact due to publishing firewalls and the disconnected utility of Academic KPIs from applied uses of research. Societal adoption of evidence-based, collaborative research-backed ideas is difficult even when open-access publishing is adopted. Part of the reason is that open access publishing can increase altmetric impacts (e.g. media and social media uptake and dissemination), but still may not achieve social impact as measured by the use of research outputs in real communities, organisations and businesses. I argue that evidence-based digital-physical social networks can build epistemic virtues and persuasive propositions for adoption by diverse stakeholders.

Toby Handfield

What will it take for reputation to sustain cooperation?

A number of formal models have shown that indirect reciprocity can sustain cooperation. This is particularly plausible as an account of what underlies online institutions like eBay, Uber, and Wikipedia. But these models have all made extremely idealised assumptions about the reliability of reputation information. In this talk, I present some modelling results which show that once these assumptions are relaxed, cooperation collapses. I then discuss some ideas about how reputation might actually work in the real world.

Remco Heesen

Changing Peer Review to Open Science

Peer review plays an important role in the way information flows through scientific networks, by acting as a gatekeeper. The current implementation of peer review is highly costly: it takes up an enormous amount of time, retrieving results from behind a paywall weighs heavily on library budgets, and the various known and suspected biases that infect peer review carry an epistemic cost. In contrast the benefits of peer review are surprisingly murky. In this talk I argue that these benefits can be acquired just as well from a different implementation of peer review (namely, open post-publication review). More specifically I suggest that the most important (perceived) benefit of peer review – allowing scientists and outsiders to identify high-quality work – would actually be enhanced by switching to open post-publication review, because it allows one to benefit from the wisdom of the crowds.

Colin Klein

Online Conspiracy Theories: A multi-method approach

I will discuss several collaborative studies we have done on the r/conspiracy forum of Reddit.com. A guiding feature of each is the attempt to link theories about individual psychology to broader dynamic and network factors, using topic modeling, sentiment analysis, and examination of commenting networks. I will focus on the question of whether forums like r/conspiracy are better thought of as converting the naïve or as entrenching shared interests.

Allison Morgan

Faculty hiring and the spread of scientific ideas

The spread of ideas in the scientific community is often viewed as a competition, in which good ideas spread further because of greater intrinsic fitness. However, relatively little is known about how structural factors influence the spread of ideas, and specifically institutional prestige. Here, we investigate the role of faculty hiring networks in shaping the spread of ideas in computer science. We consider comprehensive data on the hiring events of 5,032 faculty at all 205 Ph.D.-granting departments of computer science in North America, and on the timing and titles of 200,476 associated publications. Using numerical simulations, we find that research from prestigious institutions spreads more quickly and completely than work of similar quality originating from less prestigious institutions. These results suggest a lower bound for epistemic inequality, identify a mechanism for the persistent epistemic advantage observed for elite institutions, and highlight limitations for meritocratic ideals.

Erik Olsson

Why Bayesian Agents Polarize

A number of studies have concluded that polarization may be rational in the sense that even ideal Bayesian agents can end up seriously divided on an issue given exactly the same evidence. In this spirit, Pallavicini, Hallsson and Kappel (2018) demonstrate that group polarization is a very robust phenomenon in the Bayesian so-called Laputa model of social network deliberation. However, in their view polarization arises due to a failure of Laputa to take into account higher-order information in a particular way, making the model incapable of capturing full rationality. I show that taking into account higher-order information in the way proposed by Pallavicini et al. fails to block polarization. Rather, what drives polarization is expectation-based updating in combination with a modelling of trust in a source that recognizes the possibility that the source is systematically biased. Finally, I show that polarization may be rational in a further sense: group deliberations that lead to polarization can be, and often are, associated with increased epistemic value at the group level. The upshot is a strengthened case for the rationality of polarization.

Ignacio Ojea Quintana

Schelling Segregation in Online Social Networks

This essay provides an explanation for online segregation and homophily by adapting some ideas originally developed by Schelling [18, 19, 20]. In Schelling's segregation model, agents of two types are located in a 2D lattice and are motivated to live in a neighborhood that matches the minimum desired fraction of members of the same type. The model reveals that high degrees of macro segregation can emerge even with moderate homophily preferences at the micro level. Here we build a Schelling-like model for Online Social Networks where agents form and cut bonds with others for the purpose of satisfying homophily and heterophily preferences. Like in Schelling's original model, segregation emerges as a macro phenomenon even when individual agents have mild homophily preferences. Yet, we show that heterophily has more effect than homophily in unequal populations. The results are demonstrated via simulations using Netlogo. Since the model is designed to represent the dynamics of friending/unfriending and following/unfollowing in social media like Twitter, Facebook or Instagram, it might provide some insight on how online communities self-organize according to tribes.

Sarita Rosenstock

What and how we can learn from epistemic network simulations

Philosophers and social scientists have invoked highly idealised agent-based simulations to explore the relationship between communication network structure among the agents, and their collective ability to learn about the "world". These simulation results have been thought-provoking, but it is unclear how they can support claims about their real-world modelling targets. In this talk I will discuss the nature and limitations of knowledge derived from such epistemic network simulations, and the conditions under which they might be (cautiously) used to inform policy decisions.

Robert Simpson

The Expertise Problem and Higher Education Governance

In order for universities to effectively realise their epistemic aims – roughly, the discovery and dissemination of higher-level knowledge – their academic appointees should enjoy some measure of self-governance. But those appointees need to be appointed in the

first place, and they should be periodically subject to some form of external review, lest their disciplines of inquiry run off the epistemic rails and turn into cabalistic sects. At both stages novices have to judge competing claims to disciplinary expertise, despite the fact that they themselves, by dint of being novices, lack the expertise to straightforwardly assess which of the putative experts are bona fide experts. University governance thus raises a version of what Alvin Goldman calls the novice/2-expert problem. Goldman proposes various approaches – including reviewing track records, considering possible biases, and seeking out meta-experts – that the novice can pursue in order to address this problem in a way that's better than sheer guesswork. I will argue that addressing the 2-expert problem in university governance is at once easier and more complex than in Goldman's individualistic version of the problem. It's easier since competing claims to expertise can sometimes both be accommodated in a university system. (Roughly, we can appoint both putative experts.) It's more complex insofar as the kinds of expertise that are represented by different academic disciplines are more or less amenable to different forms of novice appraisal, e.g. technological disciplines of inquiry are better assessed via the 'track record' method, whereas interpretative disciplines are better assessed via the 'checking biases' method. University governance is liable to misjudge claims to expertise if there is a failure to recognise the differences in kind between different disciplines of inquiry.

Lexing Xie

Networks of Attention, Online Discussions, and Academic Influence

"I intend to discuss three distinct lines of recent work concerning different networks in the Computational Media Lab (http://cm.cecs.anu.edu.au). I hope the different problems, approaches, and three demos will engender further discussion.

The first is in extending stochastic point process models to describe and forecast online video popularity under external promotions. We use the Hawkes Intensity Process (dubbed HIP) model to describe the continuous interaction between external promotions (e.g. tweets about a video) and popularity dynamics (e.g. daily views). This answers question such as: Can we explain the complex multi-phased popularity dynamics widely seen online? Can one predict what could become viral? Can one predict what would not become viral even if heavily promoted?
http://cm.cecs.anu.edu.au/post/expecting_to_be_HIP/

The second is GraphDiff, a new visualisation technique that highlights the intersection and differences of two graphs. We use this to compare entity (people, places, organisation) co-occurrences over different time periods (e.g. before or after some event) or different social media streams (e.g. news vs facebook). This tool can open up further inquiries into what could explained the observed differences or what led to them. ""Visualizing Graph Differences from Social Media Streams"". Shin et al. WSDM Demo, 2019. doi:10.1145/3289600.3290616

The third topic are Influence Flowers for academic entities. A simple and intuitive visual metaphor for the incoming and outoing intellectual influence (measured by citations/references) of an academic entity – people, project, organisations or publication venues. The Influence Flower is an ego-centric graph, with a query entity placed in the centre. The petals are styled to reflect the strength of influence to and from other entities of the same or different type. We demonstrate through several case studies that the Influence Flower supports data-driven inquiries about the following: researchers' careers over time; paper(s) and projects, including those with delayed recognition; the interdisciplinary profile of a research institution; and the shifting topical trends in conferences. We also use this tool on influence data beyond academic citations, by contrasting the academic and Twitter activities of a researcher. VAST 2019 paper http://influencemap.ml/vast19, https://arxiv.org/abs/1907.12748, live website http://influencemap.ml"

Kevin Zollman

Wisdom of the crowds and information cascades: modeling the boundary

Two famous mathematical results stand as antipodes in the discussion of group rationality. On the one hand, the Condorcet Jury Theorem establishes that crowds can be wise under appropriate conditions. On the other, models of information cascades show how even perfectly rational individuals can collectively ignore most of the available information and herd toward a wrong belief. The difference between the two models are small, but critical. In the information cascades model each individual sees the "vote" of others. In the Condorcet Jury Theorem, they do not. In this talk I explore the middle ground between these two. One surprising discovery, is that groups do better when they are systematically misinformed about one another.