Social foundations for statistics and machine learning
Opening remarks

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Motivation for the workshop

Speakers and schedule

Logistics

Science has been in a "replication crisis" for a decade. Have we learned anything?

Paperclip-making robots 'wipe out humanity' in killer AI Doomsday experiment

Big-Data Algorithms Are Manipulating Us All

Single agent decision theory and societal challenges

- Current foundation for both statistics and machine learning (ML):
  Single-agent decision theory.

- This framework cannot address important scientific and societal challenges:

  1. Replication crisis, publication bias, p-hacking, pre-registration,
     reforms of statistics teaching and the publication system.

     A single agent has no reason to mislead themselves / selectively report!

  2. The social impact of AI,
     algorithmic discrimination and inequality,
     value alignment of autonomous agents / robots.

     A single agent has no distributional conflicts / value misalignment!

- Multiple agents have different objectives and information.

Science and technology are social (not single agent) activities!

- This is well understood in the philosophy, sociology, and history of science.

- But how to turn this insight into formal, prescriptive recommendations?

- Possible contributions of economics?

  - We share the languages of constrained optimization and probability theory with statistics and ML.

  - But we are also used to considering multiple agents with unequal endowments, conflicting interests, private information.

  - Use the toolkit of mechanism design to characterize optimal statistical decisions subject to constraints of implementability.

  - Use the tooolkit of causal inference and welfare economics to analyze the social impact of algorithmic decisions, and devise alternative algorithm objectives.

Our speakers

- Isaiah Andrews (Econometrics)

- Celestine Mendler-Dünner (Computer Science)

- Lily Hu (Philosophy)

- Carina Prunkl (Philosophy)

- Jann Spiess (Econometrics)

- Ana-Andreea Stoica (Computer Science)

Workshop schedule part 1: Tutorial lectures

- Monday, May 22
  - 12:00 Carina Prunkl: *Algorithms and social epistemology*
  - 14:15 Celestine Mendler-Dünner: *Performative Prediction*
  - 16:00 Jann Spiess: *Econometrics with Misaligned Preferences*

- Tuesday, May 23
  - 11:30 Lily Hu: *Causal Inference and the Problem of Variable Choice*
  - 14:15 Isaiah Andrews: *Correcting for Selective Publication and Attention*
  - 16:00 Ana-Andreea Stoica: *Diagnosing and mitigating bias in networks*

- Wednesday, May 24
  - 11:30 Nika Haghtalab: *Foundations of learning and incentives*

Workshop schedule part 2: Frontier talks

- Wednesday, May 24
  - 16:00 Ana-Andreea Stoica:
    New models and insights in network interference problems

- Thursday, May 25
  - 11:30 Carina Prunkl: *Noise - a flaw in algorithmic judgment?*
  - 14:15 Jann Spiess:
    Explanations with a purpose: regulating black-box algorithmic decisions
  - 16:00 Celestine Mendler-Dünner: *Algorithmic Collective Action in ML*

- Friday, May 26
  - 11:30 Nika Haghtalab: *Multi-objective learning: A unifying perspective on collaboration, fairness, and robustness*
  - 14:15 Isaiah Andrews: *A Model of Scientific Communication*
  - 16:00 Lily Hu: *Do Causal Diagrams Assume a Can Opener?*

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- For everyone:
  - Concluding panel discussion: Saturday, May 27, 10:00.
  - Coffee and pastries: Outside SR C.
  - Pub evening: Wednesday, May 24, 5:30pm, King's Arms.
- For speakers:
  - Lunch in the department: Common Room.
  - Break room: Room 2126.
  - Dinners at Nuffield: Tuesday & Thursday. Meet there 18:40.
  - Guided tour of Oxford: Wednesday, 13:45, starting at Manor Road.

Some other events this week

- *Panel discussion with Raj Chetty and Joseph Stiglitz*
  Today, 17:00, Mathematical Institute, L1 Lecture Theatre

- *Automatic Debiased Machine Learning via Neural Nets*
  Whitney Newey
  Tuesday, 13:00, Manor Road Building, Skills Lab

- *Valid Heteroskedasticity Robust Testing*
  Benedikt Poetscher
  Friday, 14:15, Manor Road Building, Room A

Thank you!