Privacy and Ethics in Pandemic Data Collection and Processing

Institute for Computational and Experimental Research in Mathematics (ICERM)

https://icerm.brown.edu/topical_workshops/tw-23-pep/

January 17, 2023 - January 20, 2023

Tuesday, January 17, 2023

8:45 - 9:00 am EST

Check In

11th Floor Collaborative Space

9:00 - 9:15 am EST

Welcome

11th Floor Lecture Hall

Session Chair

Brendan Hassett, ICERM/Brown University

9:15 - 10:00 am EST

Opening plenary: Introduction to MAPPS; Participant introductions

Opening Remarks - 11th Floor Lecture Hall

Mark Lurie, Brown University

10:00 - 10:30 am EST

Coffee Break

11th Floor Collaborative Space

10:30 - 11:15 am EST

Keynote: Modeling epidemics with network data

11th Floor Lecture Hall

Speaker

Samuel Scarpino, Northeastern University

Session Chair

Jeremy Goldhaber-Fiebert, Stanford University

Abstract

The COVID-19 pandemic has upended our societies and re-shaped the way we go about our day-to-day lives—from how we work and interact to the way we buy groceries and attend school. In this talk, I will present a series of studies exploring how our behavior, mobility patterns, and social networks have altered and been altered by COVID-19. Leveraging global data sets that represent billions of people, I will show how myriad factors interacted to shape the course of the pandemic. Using the lessons learned from COVID-19, I will discuss how we might balance the ethical and privacy considerations around high-resolution mobility data with their critical role in responding to epidemics.

11:15 am - 12:00 pm EST

Keynote: Privacy and epidemic modeling

11th Floor Lecture Hall

Speaker

Katrina Ligett, Hebrew University of Jerusalem

Session Chair

Jeremy Goldhaber-Fiebert, Stanford University

12:00 - 1:30 pm EST

Lunch/Free Time

1:30 - 2:30 pm EST

Session: Envisioning the data needs of MAPPING@Brown

11th Floor Lecture Hall

Speakers

Jason Gantenberg, Brown University

Kimani Toussaint, Brown University

Thomas Trikalinos , Brown University

Guixing Wei, Brown University

Session Chair

Mark Lurie, Brown University

2:30 - 3:00 pm EST

Coffee Break

11th Floor Collaborative Space

3:00 - 4:30 pm EST

Breakout 1: Data needs for MAPPING@Brown - led by Mark Lurie

	Group Work
4:30 - 5:00 pm EST	**Report-outs and Instructions** Group Presentations - 11th Floor Lecture Hall **Session Chair** Mark Lurie, Brown University
5:00 - 6:30 pm EST	**Reception** 11th Floor Collaborative Space

Wednesday, January 18, 2023

8:45 - 9:00 am EST	**Check In** 11th Floor Collaborative Space
9:00 - 9:15 am EST	**Welcome** 11th Floor Lecture Hall **Session Chair** Megan Ranney, Brown University
9:15 - 10:00 am EST	**Keynote: Synthetic data for network modeling** 11th Floor Lecture Hall **Speaker** Adam Smith, Boston University **Session Chair** Anna Lysyanskaya, Brown University
10:00 - 10:30 am EST	**Coffee Break** 11th Floor Collaborative Space
10:30 - 11:15 am EST	**Keynote: Key concerns and principles for large-scale data collections and surveillance** 11th Floor Lecture Hall **Speaker** Julia Netter, Brown University **Session Chair** Wilmot James, Columbia University
11:15 am - 12:00 pm EST	**Keynote: Differential privacy in graphs** 11th Floor Lecture Hall **Speaker** Sofya Raskhodnikova, Boston University **Session Chair** Wilmot James, Columbia University
12:00 - 1:00 pm EST	**Lunch/Free Time**
1:00 - 1:30 pm EST	**Prep for Breakouts** Group Work - 11th Floor Lecture Hall
1:30 - 2:30 pm EST	**Breakout 2: Privacy and data collection in the context of MAPPING@Brown - led by Julia Netter** Group Work
2:30 - 3:00 pm EST	**Coffee Break** 11th Floor Collaborative Space
3:00 - 4:30 pm EST	**Breakout 3: Applications of differential privacy for MAPPING@Brown - led by Anna Lysyanskaya** Group Work - 11th Floor Lecture Hall

4:30 - 5:00 pm EST

Report-outs and Instructions

Group Presentations - 11th Floor Lecture Hall

Session Chair

Julia Netter, Brown University

Thursday, January 19, 2023

8:45 - 9:00 am EST

Check In

11th Floor Collaborative Space

9:00 - 9:15 am EST

Introductory Remarks and Breakout Prep

Opening Remarks - 11th Floor Lecture Hall

Session Chair

Thomas Trikalinos , Brown University

9:15 - 10:00 am EST

Keynote: A survey of modeling approaches that use social mixing data

11th Floor Lecture Hall

Gerardo Chowell, Georgia State University

Abstract

The COVID-19 pandemic has highlighted the urgent need to develop reliable tools to forecast the trajectory of epidemics and pandemics in near real time. We describe and apply an ensemble n-sub-epidemic modeling framework for predicting the course of epidemics and pandemics. We systematically assess its calibration and short-term forecasting performance and compare it with other competitive statistical models. This sub-epidemic framework has demonstrated reliable forecasting performance in the context of COVID-19 and monkeypox epidemics.

10:00 - 10:30 am EST

Coffee Break

11th Floor Collaborative Space

10:30 am - 12:00 pm EST

Breakout 4: Design and Anaylsis of a MAPPING@Brown embedded simulation - led by Thomas Trikalinos and Jason Gantenberg

Group Work

12:00 - 1:00 pm EST

Lunch/Free Time

1:00 - 1:15 pm EST

Prep for Breakout

Group Work - 11th Floor Lecture Hall

1:15 - 2:00 pm EST

State of the sciene: Multiparty computation

11th Floor Lecture Hall

Speaker

Peihan Miao, Brown University

Session Chair

Anna Lysyanskaya, Brown University

Abstract

Secure Multi-Party Computation (MPC) enables multiple entities to perform joint computations on their private data without exposing the data to one another. Since its introduction in the 1980s, MPC has been one of the most active research areas in cryptography, due in part to its wide applications and promising security guarantees. Over the last decade, MPC has gradually progressed from being purely of theoretical interest to being adopted more and more in practice. Yet, the adoption of MPC in real-world settings is still very limited as of today. In light of the recent data privacy legislations, there is an urgent need for bridging the gap between the theoretical feasibility and practical efficiency of MPC. Research in this area spans both theoretical and applied cryptography. In theory, we develop new techniques for achieving general MPC with the optimal complexity, bringing theory closer to practice. In practice, we design tailored MPC to achieve the best concrete efficiency for specific real-world applications. In this talk, I will discuss the challenges in both directions and how to overcome these challenges using cryptographic approaches.

2:00 - 2:45 pm EST

Keynote: Efficient and scalable muliparty computation

11th Floor Lecture Hall

Speaker

Vlad Kolesnikov, Georgia Institute of Technology

Session Chair

	Anna Lysyanskaya, Brown University
2:45 - 3:15 pm EST	**Coffee Break** 11th Floor Collaborative Space
3:15 - 4:45 pm EST	**Breakout 5: Multi-party computation for analyzing MAPPING@Brown mobility data - led by Anna Lysyankaya** Group Work
4:45 - 5:00 pm EST	**Report-outs and Instructions** Group Presentations - 11th Floor Lecture Hall **Session Chair** Anna Lysyanskaya, Brown University
6:30 - 7:30 pm EST	**Dinner at Waterman Grille** External Event

Friday, January 20, 2023

8:45 - 9:00 am EST	**Check In** 11th Floor Collaborative Space
9:30 - 10:30 am EST	**Flipped panel led by MAPPS research team** Panel Discussion - 11th Floor Lecture Hall
10:30 - 11:00 am EST	**Coffee Break** 11th Floor Collaborative Space
11:00 am - 12:00 pm EST	**Synthesis Session: Envisioning the next 5 years** Problem Session - 11th Floor Lecture Hall
12:00 - 1:30 pm EST	**Lunch & Departure** Lunch/Free Time

All event times are listed in ICERM local time in Providence, RI (Eastern Standard Time / UTC-5).