TAMALIKA MUKHERJEE

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EDUCATION

Purdue University 2016-2023
Ph.D. in Computer Science

Rochester Institute of Technology 2011-2016
B.S./M.S. in Computational and Applied Mathematics

RESEARCH INTERESTS

My research focuses on the efficient algorithmic design of privacy-preserving mechanisms, particularly differential privacy. I also examine the social implications of these mechanisms through an equity and policy lens, by employing tools from machine learning and collaborating with lawyers and sociologists.

WORK EXPERIENCE

- **Postdoctoral Research Scientist, Columbia University** (August, 2023 - Present). Working on research problems related to the efficient algorithmic design of differential privacy and impacts of private algorithms on policy and law with Dr. Rachel Cummings.
- **Student Researcher, Google** (September, 2022 - December, 2022). Developed differentially private sublinear-space algorithms for clustering in the streaming model under the guidance of Dr. Alessandro Epasto with the Graph Mining team in Google NYC.
- **Research Intern, Analog Devices Inc.** (October, 2017 - December, 2018). Investigated theoretical constructions of cryptographic primitives such as fuzzy extractors under the guidance of Dr. John Ross Wallrabenstein.
- **Microsoft Explorer Intern, Microsoft** (June, 2013 - August, 2013). Delivered a sample application outlining an authentication protocol which won first place at the Microsoft Interns fair.

HONORS AND AWARDS

- Spotlight Speaker, Machine Learning Symposium at the New York Academy of Sciences, 2024.
- Rising Star, 5th TCS Women Workshop, 2022.
- Bilsland Dissertation Fellowship, 2022.
- Teaching Academy Graduate Teaching Award, 2021.
- Harris Award for Supporting Women Students in Computer Science classes, 2017.
- RIT Outstanding Undergraduate Scholar, 2014.
- RIT John Wiley Jones Outstanding Student in Science Award, 2014.
- RIT Outstanding Service of an International Student Award, 2014.

PUBLICATIONS (AUTHORS LISTED ALPHABETICALLY)

Journal Papers

1. *Equitable Differential Privacy,* V. Kaul, and T. Mukherjee, Frontiers in Big Data, Volume 7, 2024.

2. *On Computing Discretized Ricci Curvatures of Graphs,* B. DasGupta, E. Grigorescu, T. Mukherjee, Theoretical Computer Science, Volume 975, 2023.

Conference Papers

1. *Differential privacy and Sublinear time are incompatible sometimes,* J. Blocki, H. Fichtenberger, E. Grigorescu, and T. Mukherjee, ITCS 2025.
2. *How to Make Your Approximation Algorithm Private: A Black-Box Differentially-Private Transformation for Tunable Approximation Algorithms of Functions with Low Sensitivity,* J. Blocki, E. Grigorescu, T. Mukherjee, S. Zhou, RANDOM 2023.
3. *Differentially Private L2-Heavy Hitters in the Sliding Window Model*, J. Blocki, S. Lee, T. Mukherjee, S. Zhou, ICLR 2023.
4. *Privately Estimating Graph Parameters in Sublinear time,* J. Blocki, E. Grigorescu, T. Mukherjee, ICALP 2022.
5. *Differentially-Private Sublinear-Time Clustering,* J. Blocki, E. Grigorescu, T. Mukherjee, ISIT 2021.
6. *P_4-free Partition and Cover Numbers*, A. Block, S. Brânzei, H. K. Maji, H. Mehta, T. Mukherjee, H. Nguyen, ITC 2021.
7. *Lattice Reduction for Modules, or How to Reduce ModuleSVP to ModuleSVP,* T. Mukherjee, N. Stephens-Davidowitz, CRYPTO 2020.
8. *Estimating Gaps in Martingales and Applications to Coin-Tossing: Constructions & Hardness,* H. Amini Khorasgani, H.K. Maji, T. Mukherjee, TCC 2019.

Preprints and Working Papers

1. *The Power of Graph Sparsification in the Continual Release Model,* A. Epasto, Q. C. Liu, T. Mukherjee, F. Zhou.
2. *Differentially Private Clustering in Data Streams,* A. Epasto, T. Mukherjee, and P. Zhong.
3. *Differentially Private Space-Efficient Algorithms for Frequency Moment Estimation in the Turnstile Model,* R. Cummings, A. Epasto, T. Mukherjee, J. Mao, T. Ou and P. Zhong.
4. *The Hidden Costs of Privacy Choice for Marginalized Groups,* R. Cummings, T. Gillis, T. Mukherjee.

INVITED TALKS

1. *Differential Privacy and Sublinear time are incompatible sometimes*
   - Rutgers Business School (November 2024)
   - KU Leuven (September 2024)
   - BARC at the University of Copenhagen (August 2024)
   - Contributed talk at Theory and Practice of Differential Privacy (TPDP) (August 2024).
2. *Differentially Private Clustering in Data Streams*
   - 15th Annual Machine Learning Symposium, New York Academy of Sciences (October 2024).
3. *The Hidden Costs of Privacy Choice for Marginalized Groups*
   - Privacy and Public Policy Conference, Georgetown Univeristy (September 2024).
   - INFORMS (October 2024).

4. *Differentially Private Space-Efficient Algorithms for Frequency Moment Estimation in the Turnstile Model*
    - Allerton Conference (September 2024).
5. *Equitable Differential Privacy*
    - New York City Privacy Day (April 2024).
6. *How to Make Your Approximation Algorithm Private: A Black-Box Differentially-Private Transformation for Tunable Approximation Algorithms of Functions with Low Sensitivity*
    - CUNY Queens College (February 2024)
    - Dartmouth University (November 2023)
    - Columbia Theory Seminar (October 2023)
    - New York University Theory Seminar (October 2023)
    - Rutgers Theory Seminar (October 2023)
    - BARC at the University of Copenhagen (April, 2023)
    - Quarterly Theory Workshop: 2022 Junior Theorists Workshop (January, 2023)
    - Boston University Theory Seminar (October 2022)
7. *Differentially Private Sublinear Algorithms*
    - Workshop on Local Algorithms (June 2022)
    - 5th TCS Women Spotlight Workshop (June 2022).
8. *Privately Estimating Graph Parameters in Sublinear-time*
    - Rutgers/DIMACS Theory of Computing Seminar, March 2022.
9. *Lattice Reduction for Modules, or How to Reduce ModuleSVP to ModuleSVP*
    - Joint Online Crypto Seminar organized by ENS Lyon, Royal Holloway University London and CWI Amsterdam (February 2021)
    - Midwest Theory Day (November 2019)
10. *Estimating Gaps in Martingales and Applications to Coin-Tossing: Constructions & Hardness*
    - Karlsruhe Institute of Technology and Ruhr-University Bochum, Germany, (December 2019)
    - EPFL, Switzerland (December 2019)
    - Midwest Theory Day (April 2019)

INVITED WORKSHOPS AND RESEARCH VISITS

- Workshop on Defining Holistic Private Data Science for Practice, University of California San Diego, USA, January, 2025.
- Research Visit hosted by Rasmus Pagh, BARC, University of Copenhagen, Denmark, August, 2024.
- Contextual Integrity for Differential Privacy, Banff International Research Station, Canada, August, 2023.
- Research Visit hosted by Rasmus Pagh, BARC, University of Copenhagen, Denmark, April, 2023.

PROFESSIONAL ACTIVITIES

- **Program Committee.**
  1. RANDOM 2025
  2. IEEE SaTML 2025
  3. IEEE TPS 2024
  4. CFAIL 2023
- **Conference (Sub)Reviewer.**
  1. Neural Information Processing Systems (Neurips): 2025-2020
  2. IEEE Symposium on Foundations of Computer Science (FOCS): 2024-2023
  3. ACM-SIAM Symposium on Discrete Algorithms (SODA): 2025-2024
  4. EATCS International Colloquium on Automata, Languages and Programming (ICALP): 2024-2023
  5. Innovations in Theoretical Computer Science (ITCS): 2025, 2024, 2022
  6. International Conference on Randomization and Computation (RANDOM): 2024, 2021
  7. IEEE Symposium on Security and Privacy (S&P): 2023, 2022
- **Other Activities.**
  1. **Co-Organizer** of New York City Privacy Day, Fall 2023.
  2. **Organizer** of the Purdue CS Theory Reading group (2021-2022).
  3. **President** of Computer Science Graduate Student Association at Purdue University (January 2019-April 2020).