Calvin Roth

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calvinroth.github.io

EDUCATION

University of Minnesota, Twin Cities   **Fall 2022-Current**

PhD, Industrial Engineering

- *Advised by:* Ankur Mani
- *Committee:* Nick Arnosti, William Cooper, Krishnamurthy Iyer, Murti Salapaka

University of Minnesota, Twin Cities   **Fall 2020-Spring 2022**

Master of Science, Computer Science

University of Minnesota, Twin Cities   **Spring 2020**

Bachelor of Science, Math (Cum Laude)

- Thesis Title: "An Overview of Factoring Algorithms"
- *Advised by:* Daniel Johnstone

RESEARCH INTERESTS

Methodologies: Stochastic Processes, Game Theory, AI, Causal Inference, Computational Methods, Machine Learning

Applications: Network Economics, Misinformation, Revenue Management, Social Commerce

PUBLICATIONS

- Morgan, Nathaniel, Caleb Yenusah, Adrian Diaz, Daniel Dunning, Jacob Moore, Erin Heilmanet, Calvin Roth al. 2024. "On a Simplified Approach to Achieve Parallel Performance and Portability across CPU and GPU Architectures." *Information* 2024

- Calvin Roth, Ankur Mani, Krishnamurthy Iyer "Peer Filtering: Democratic Misinformation Control in Social Networks" *INFORMS annual meeting, Seattle, Washington, 2024; NetSci Conference, Québec City, Canada 2024; Conference on Network science and Economics, Minneapolis, Minnesota, 2024*

  – Full Paper in preparation for Operations Research

- Calvin Roth, Ankur Mani, Jiali Huang. "The Value of Community Information for Pricing Under Network Externalities" *INFORMS annual meeting, Atlanta, Georgia, 2025; Revenue Management Conference, London, England, 2023; Network Science and Economics, Stanford, California, 2025.*

  - Full paper in preparation for Management Science

- Calvin Roth, Krishnamurthy Iyer, Ankur Mani, "Peer Filtering: The Power of Networks to Self-moderate Misinformation" *Marketplace Innovation Workshop, Online, 2025*

AWARDS AND HONORS

- Top 100 projects, R&D world, 2024

- Mathematics and Computer Science of Market and Mechanism Design Summer school student, Simons Laufer Mathematical Sciences Institute, 2023

- Travel Grant Award, University of Minnesota, 2023

- Travel Grant Award, University of Minnesota, 2024

COURSEWORK & SKILLS

Coursework

Probability and Statistics, Advanced Algorithms and Data Structures, Numerical Methods, Modern Cryptography, Abstract Algebra, Introduction to Parallel Computing, Program Design & Development, Intro to Machine Learning, Matrix Theory, Sparse Linear Algebra, Intro to Network Science, Combinatorial Theory, Optimization, Stochastic Processes, Engineering the allocation of Public Resources, Game Theory, Modeling & Analysis of Queuing Systems, Causal Learning & Discovery

Programming Languages

Fluent: C/C++, Python, Julia *Familiar:* OCaml, Prolog, Agda, Html/CSS/JavaScript, R

WORK EXPERIENCE

University of Minnesota, Statistics Department　　　**June 1-August 20 2024**
Research Assistant

- Developed code for (de)-anonymization algorithms over networks.

Los Alamos National Laboratory   **June-August 2022**

Parallel Computing Summer Research Internship

- Created code to auto-generate a documentation website using Doxygen and Sphinx.
- Implemented sparse datatypes for the parallel computing library MATAR, improving ease of use.
- Completed parallel coding projects working across GPUs and CPUs.

University of Connecticut   **June-August 2019**

Semi-Quantum Key Distribution

- Derived equations to model the state of various Quantum Communication Protocols.
- Applied statistics and numerical methods to calculate better bounds on the allowed noise rate in the channel that the protocol can allow.

Activated Research Company   **June-August 2018**

Software Engineer Intern

- Website development using HTML, MySQL, and JavaScript.
- Created interactive data visuals using JavaScript and plotly.
- Low-level Arduino programming to control mechanical systems.

TEACHING EXPERIENCE

University of Minnesota

- Discrete Structures of Mathematics   **Fall 2018**
- Linear Algebra and Differential Equations   **Fall 2020**
- Formal Languages and Automata Theory   **Spring & Fall 2021, Spring 2022**
- Matrix Theory   **Fall 2021**
- Optimization for Machine Learning   **Fall 2022, 2023**
- Quality Engineering and Six Sigma   **Spring 2023**
- Computational Software TA   **Fall 2024, Fall 2025**

OTHER EXPERIENCES

Simons Laufer Mathematical Sciences Institute   **June 20-June 30, 2023**

Graduate Summer School Participant

- Studied algorithmic market design and presented on Refugee Allocation Algorithms.

Practical Skills for R&D Leaders   **Fall 2025**

Participant

- Program to foster leadership and project management skills for graduate students in STEM.

REFERENCES

●Ankur Mani, Assistant Professor, Department of Industrial and Systems Engineering University of Minnesota, amani@umn.edu

●Krishnamurthy Iyer, Associate Professor, Department of Industrial and Systems Engineering University of Minnesota, kriyer@umn.edu