

R. Teal Witter

✉ rtealwitter@nyu.edu • 🌐 www.rtealwitter.com • 🌐 rtealwitter

Education

New York University

PhD in Computer Science

Advised by Lisa Hellerstein and Christopher Musco

New York, NY

September 2020–Present

Middlebury College

BA in Mathematics, BA in Computer Science

Phi Beta Kappa, Summa Cum Laude

Middlebury, VT

February 2017–May 2020

Research Interests

Algorithms for Social Good • Explainable AI • Fairness • Randomized Linear Algebra • Machine Learning • Deep Learning • Discrete Optimization • Graph Theory • Quantum Computing

National Awards

NSF Graduate Research Fellow

2022-2025

Goldwater Scholar

2019

Academic All-American

2015

Teaching

Randomized Algorithms for Data Science

Course Instructor

Middlebury CSCI 1052

Winter 2024

Deep Learning

Course Instructor

Middlebury CSCI 1051

Winter 2023

Deep Learning

Course Assistant

NYU CS-GY 6953

Fall 2022, Spring 2023, Fall 2023

Algorithmic Machine Learning and Data Science

Course Assistant

NYU CS-GY 6763

Fall 2021, Spring 2022, Fall 2023

Machine Learning

Course Assistant

NYU CS-GY 6923

Spring 2021, Spring 2023

Preprints

**In the tradition of theoretical computer science, authors appear in alphabetical order unless otherwise noted with an asterisk.*

- [1] Y. Liu, R. T. Witter, F. Korn, T. Alrashed, D. Paparas, J. Freire. *Kernel Banzhaf: A Fast and Robust Estimator for Banzhaf Values*. 2024.*

- [2] C. Musco, R. T. Witter. *Provably Accurate Shapley Value Estimation via Leverage Score Sampling*. 2024.
- [3] K. Arabi, B. Feuer, R. T. Witter, C. Hegde, N. Cohen. *Hidden in the Noise: Two-Stage Robust Watermarking for Images*. 2024.*
- [4] L. Rosenblatt, R. T. Witter. *FairlyUncertain: A Comprehensive Evaluation of Uncertainty in Algorithmic Fairness*. 2024.
- [5] R. T. Witter, L. Hellerstein. *Minimizing Cost Rather Than Maximizing Reward in Restless Multi-Armed Bandits*. 2024.*

Peer-Reviewed Publications

- [6] R. T. Witter and C. Musco. *Benchmarking Estimators for Natural Experiments: A Novel Dataset and a Doubly Robust Algorithm*. Conference on Neural Information Processing Systems, 2024.*
- [7] R. T. Witter and L. Rosenblatt. *I Open at the Close: A Deep Reinforcement Learning Evaluation of Open Streets Initiatives*. AAAI Conference on Artificial Intelligence, 2024.*
- [8] M. Czekanski, S. Kimmel, R. T. Witter. *Robust and Space-Efficient Dual Adversary Quantum Query Algorithms*. European Symposium on Algorithms, 2023.
- [9] L. Rosenblatt, R. T. Witter. *Counterfactual Fairness Is Basically Demographic Parity*. AAAI Conference on Artificial Intelligence, 2023.*
- [10] L. Hellerstein, D. Kletenik, N. Liu, R. T. Witter. *Adaptivity Gaps for the Stochastic Boolean Function Evaluation Problem*. Workshop on Approximation and Online Algorithms, 2022.
- [11] L. Hellerstein, T. Lidbetter, R. T. Witter. *A Local Search Algorithm for the Min-Sum Submodular Cover Problem*. International Symposium on Algorithms and Computation, 2022.
- [12] C. Musco, I. Ramesh, J. Ugander, R. T. Witter. *How to Quantify Polarization in Models of Opinion Dynamics*. International Workshop on Mining and Learning with Graphs, 2022.
- [13] S. Kimmel, R. T. Witter. *A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs*. Algorithms and Data Structures Symposium, 2021.
- [14] R. T. Witter. *Backgammon is Hard*. International Conference on Combinatorial Optimization and Applications, 2021.
- [15] R. T. Witter, A. Lyford. *Applications of Graph Theory and Probability in the Board Game Ticket to Ride*. International Conference on the Foundations of Digital Games, 2020.*
- [16] K. DeLorenzo, S. Kimmel, R. T. Witter. *Applications of the Quantum Algorithm for st-Connectivity*. Conference on the Theory of Quantum Computation, Communication and Cryptography, 2019.

Talks

Estimating the Impact of Social Programs in Resource-Constrained Settings	
NYU-KAIST Inclusive AI Workshop	<i>November 2023</i>
Robust and Space-Efficient Dual Adversary Quantum Query Algorithms	
Centrum Wiskunde & Informatica QuSoft Seminar	<i>September 2023</i>
Quantum Computing and Optimization Minisymposium at SIAM NNP	<i>October 2023</i>
Adaptivity Gaps for the Stochastic Boolean Function Evaluation Problem	
Workshop on Approximation and Online Algorithms	<i>September 2022</i>
How to Quantify Polarization in Models of Opinion Dynamics	
International Workshop on Mining and Learning with Graphs	<i>August 2022</i>
A Local Search Algorithm for the Min-Sum Submodular Cover Problem	
International Symposium on Algorithms and Computation	<i>December 2022</i>
International Workshop on Mining and Learning with Graphs	<i>January 2022</i>
Backgammon is Hard	
International Workshop on Mining and Learning with Graphs	<i>December 2021</i>
A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs	
International Workshop on Mining and Learning with Graphs	<i>August 2021</i>
Applications of Graph Theory and Probability in the Board Game <i>Ticket to Ride</i>	
International Workshop on Mining and Learning with Graphs	<i>September 2020</i>
Contributed Paper Session at the Joint Mathematics Meetings	<i>January 2020</i>
Applications of the Quantum Algorithm for <i>st</i>-Connectivity	
Conference on the Theory of Quantum Computation, Communication and Cryptography	<i>June 2019</i>

Service

Conference Reviewing

QIP 2022,ICALP 2022, TQC 2022, NeurIPS 2023, ICLR 2024, ICML 2024, NeurIPS 2024, AAI 2025

Journal Reviewing

Information Processing Letters, Theoretical Computer Science

Outreach

Extracurricular Coding Club

Instructor

Brooklyn International High School

Spring 2021-2023

Advising

Syna Sachdeva

Barnard College '26

Gaussian Splatting with Latent Representations

Summer 2024

Jack Liu

New York University '25

Latent Guidance of Large Language Models

Spring 2024-Present

Xiaorui Lei

Brooklyn International High School '22

Active Learning and Importance Sampling

Summer 2022

Bryant Chen

Brooklyn International High School '22

Active Learning and Importance Sampling

Summer 2022

References

Christopher Musco

Assistant Professor of Computer Science and Engineering, New York University
cmusco@nyu.edu

Lisa Hellerstein

Professor of Computer Science and Engineering, New York University
lisa.hellerstein@nyu.edu

Shelby Kimmel

Associate Professor of Computer Science, Middlebury College
skimmel@middlebury.edu