

# R. Teal Witter

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## Education

### New York University

*PhD in Computer Science*

Advised by Christopher Musco and Lisa Hellerstein

**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 marked with an asterisk (\*) are listed in alphabetical order.*

- [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

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- [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

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<b>Explainable AI and Leverage Score Sampling</b>	
Queens for Computing Colloquium at Queens College	<i>October 2024</i>
<b>Estimating the Impact of Social Programs in Resource-Constrained Settings</b>	
NYU-KAIST Inclusive AI Workshop	<i>November 2023</i>
<b>Robust and Space-Efficient Dual Adversary Quantum Query Algorithms</b>	
Centrum Wiskunde & Informatica QuSoft Seminar	<i>September 2023</i>
Quantum Computing and Optimization Minisymposium at SIAM NNP	<i>October 2023</i>
<b>Adaptivity Gaps for the Stochastic Boolean Function Evaluation Problem</b>	
Workshop on Approximation and Online Algorithms	<i>September 2022</i>
<b>How to Quantify Polarization in Models of Opinion Dynamics</b>	
International Workshop on Mining and Learning with Graphs	<i>August 2022</i>
<b>A Local Search Algorithm for the Min-Sum Submodular Cover Problem</b>	
International Symposium on Algorithms and Computation	<i>December 2022</i>
International Workshop on Mining and Learning with Graphs	<i>January 2022</i>
<b>Backgammon is Hard</b>	
International Workshop on Mining and Learning with Graphs	<i>December 2021</i>
<b>A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs</b>	
International Workshop on Mining and Learning with Graphs	<i>August 2021</i>
<b>Applications of Graph Theory and Probability in the Board Game Ticket to Ride</b>	
International Workshop on Mining and Learning with Graphs	<i>September 2020</i>
Contributed Paper Session at the Joint Mathematics Meetings	<i>January 2020</i>
<b>Applications of the Quantum Algorithm for st-Connectivity</b>	
Conference on the Theory of Quantum Computation, Communication and Cryptography	<i>June 2019</i>

## Service

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### Conference Reviewing

AISTATS 2025, ICLR 2025, AAAI 2025, NeurIPS 2024, ICML 2024, ICLR 2024, NeurIPS 2023, TQC 2022, ICALP 2022, QIP 2022

### Journal Reviewing

Information Processing Letters, Theoretical Computer Science

## Outreach

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### Extracurricular Coding Club

*Instructor*

### Brooklyn International High School

*Spring 2021-2023*

## Advising

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### 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-Summer 2024*

**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

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**Christopher Musco**

Assistant Professor of Computer Science and Engineering

New York University

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**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