

# R. Teal Witter

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## 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

**Middlebury, VT**

*February 2017–May 2020*

## Research Interests

Algorithm design and analysis, deep learning, discrete optimization, randomized algorithms, and 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*

## Papers

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

- [1] R. T. Witter\* and L. Hellerstein, “Minimizing cost rather than maximizing reward in restless multi-armed bandits,” in *Submission*, 2024.

- [2] R. T. Witter\* and C. Musco, "Benchmarking estimators for natural experiments: A novel dataset and a doubly robust algorithm," in *Submission*, 2024.
- [3] R. T. Witter\* and L. Rosenblatt, "I open at the close: A deep reinforcement learning evaluation of open streets initiatives," in *AAAI Conference on Artificial Intelligence*, 2024.
- [4] M. Czekanski, S. Kimmel, and R. T. Witter, "Robust and space-efficient dual adversary quantum query algorithms," in *European Symposium on Algorithms*, 2023.
- [5] L. Rosenblatt and R. T. Witter, "Counterfactual fairness is basically demographic parity," in *AAAI Conference on Artificial Intelligence*, 2023.
- [6] L. Hellerstein, D. Kletenik, N. Liu, and R. T. Witter, "Adaptivity gaps for the stochastic boolean function evaluation problem," in *Workshop on Approximation and Online Algorithms*, 2022.
- [7] L. Hellerstein, T. Lidbetter, and R. T. Witter, "A local search algorithm for the min-sum submodular cover problem," in *International Symposium on Algorithms and Computation*, 2022.
- [8] C. Musco, I. Ramesh, J. Ugander, and R. T. Witter, "How to quantify polarization in models of opinion dynamics," in *International Workshop on Mining and Learning with Graphs*, 2022.
- [9] S. Kimmel and R. T. Witter, "A query-efficient quantum algorithm for maximum matching on general graphs," in *Algorithms and Data Structures Symposium*, 2021, pp. 543–555.
- [10] R. T. Witter, "Backgammon is hard," in *International Conference on Combinatorial Optimization and Applications*, 2021.
- [11] R. T. Witter\* and A. Lyford, "Applications of graph theory and probability in the board game ticket to ride," in *International Conference on the Foundations of Digital Games*, 2020.
- [12] K. DeLorenzo, S. Kimmel, and R. T. Witter, "Applications of the quantum algorithm for st-connectivity," in *Conference on the Theory of Quantum Computation, Communication and Cryptography*, 2019.

## Talks

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### **Estimating the Impact of Social Programs in Resource-Constrained Settings**

NYU-KAIST Inclusive AI Workshop

November 2023

### **Robust and Space-Efficient Dual Adversary Quantum Query Algorithms**

Centrum Wiskunde & Informatica QuSoft Seminar

September 2023

Quantum Computing and Optimization Minisymposium at SIAM NNP

October 2023

### **Adaptivity Gaps for the Stochastic Boolean Function Evaluation Problem**

Workshop on Approximation and Online Algorithms

September 2022

### **How to Quantify Polarization in Models of Opinion Dynamics**

International Workshop on Mining and Learning with Graphs

August 2022

### **A Local Search Algorithm for the Min-Sum Submodular Cover Problem**

International Symposium on Algorithms and Computation

December 2022

International Workshop on Mining and Learning with Graphs

January 2022

### **Backgammon is Hard**

International Workshop on Mining and Learning with Graphs	December 2021
<b>A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs</b>	
International Workshop on Mining and Learning with Graphs	August 2021
<b>Applications of Graph Theory and Probability in the Board Game Ticket to Ride</b>	
International Workshop on Mining and Learning with Graphs	September 2020
Contributed Paper Session at the Joint Mathematics Meetings	January 2020
<b>Applications of the Quantum Algorithm for st-Connectivity</b>	
Conference on the Theory of Quantum Computation, Communication and Cryptography	June 2019

## Service

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### Conference Reviewing

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

### 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-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

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### 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