

R. Teal Witter

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Academic Positions

Claremont McKenna College

Claremont, CA

Department of Mathematical Sciences

Assistant Professor

July 2025–Present

Research Interests

Randomized Algorithms • Explainable AI • Watermarking for Generative AI • AI for Social Good • Fairness • Discrete Optimization • Network Science • Quantum Algorithms • Graph Theory

Education

New York University

New York, NY

Ph.D. in Computer Science

September 2020–May 2025

Pearl Brownstein Doctoral Research Award

Advisors: Christopher Musco and Lisa Hellerstein

Dissertation: Regression-based Estimators for Causal Inference and Explainable AI

Middlebury College

Middlebury, VT

B.A. in Mathematics, B.A. in Computer Science

February 2017–May 2020

Phi Beta Kappa, Summa Cum Laude

Teaching

Randomized Algorithms for Data Science

Middlebury CSCI 1052

Course Instructor

Winter 2024

Deep Learning

Middlebury CSCI 1051

Course Instructor

Winter 2023, Winter 2025

Preprints

In the tradition of theoretical computer science, an asterisk () indicates that authors are listed in alphabetical order.*

- [1] R. T. Witter, Y. Liu, C. Musco. *Regression-adjusted Monte Carlo Estimators for Shapley Values and Probabilistic Values*. 2025.
- [2] Y. Liu, R. T. Witter, F. Korn, T. Alrashed, D. Paparas, C. Musco, J. Freire. *Kernel Banzhaf: A Fast and Robust Estimator for Banzhaf Values*. 2024.
- [3] L. Rosenblatt, R. T. Witter. *FairlyUncertain: A Comprehensive Evaluation of Uncertainty in Algorithmic Fairness*. 2024.

- [4] R. T. Witter, L. Hellerstein. *Minimizing Cost Rather Than Maximizing Reward in Restless Multi-Armed Bandits*. 2024.

Peer-Reviewed Publications

- [5] K. Arabi, R. T. Witter, C. Hegde, N. Cohen. *SEAL: Semantic Aware Image Watermarking*. International Conference on Computer Vision, 2025.
- [6] C. Musco, R. T. Witter. *Provably Accurate Shapley Value Estimation via Leverage Score Sampling*.* International Conference on Learning Representations, 2025.
- [7] K. Arabi, B. Feuer, R. T. Witter, C. Hegde, N. Cohen. *Hidden in the Noise: Two-Stage Robust Watermarking for Images*. International Conference on Learning Representations, 2025.
- [8] 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.
- [9] 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.
- [10] M. Czekanski, S. Kimmel, R. T. Witter. *Robust and Space-Efficient Dual Adversary Quantum Query Algorithms*.* European Symposium on Algorithms, 2023.
- [11] L. Rosenblatt, R. T. Witter. *Counterfactual Fairness Is Basically Demographic Parity*. AAAI Conference on Artificial Intelligence, 2023.
- [12] 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.
- [13] 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.
- [14] 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.
- [15] S. Kimmel, R. T. Witter. *A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs*.* Algorithms and Data Structures Symposium, 2021.
- [16] R. T. Witter. *Backgammon is Hard*. International Conference on Combinatorial Optimization and Applications, 2021.
- [17] 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.
- [18] 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

Towards Trustworthy and Interpretable Machine Learning

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| Carleton College | November 2024 |
| Pomona College | November 2024 |
| Claremont McKenna College | December 2024 |
| Middlebury College | January 2024 |
| Explainable AI and Leverage Score Sampling | |
| Queens for Computing Colloquium at Queens College | October 2024 |
| 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 |
| A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs | |
| International Workshop on Mining and Learning with Graphs | August 2021 |
| Applications of Graph Theory and Probability in the Board Game Ticket to Ride | |
| International Workshop on Mining and Learning with Graphs | September 2020 |
| Contributed Paper Session at the Joint Mathematics Meetings | January 2020 |
| Applications of the Quantum Algorithm for st-Connectivity | |
| Conference on the Theory of Quantum Computation, Communication and Cryptography | June 2019 |

Service

Conference Reviewing

ICCV 2025, ICML 2025, 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

Extracurricular Coding Club

Instructor

Brooklyn International High School

Spring 2021-2023

Advising

Shingo Kodama

Middlebury College '28

Syna Sachdeva

Barnard College '26

Jack Liu

New York University '25

Xiaorui Lei

Brooklyn International High School '22

Bryant Chen

Brooklyn International High School '22

Semantic and Distortion-Free LLM Watermarks

Spring 2025-Present

Gaussian Splatting with Latent Representations

Summer 2024

Latent Guidance of Large Language Models

Spring 2024-Summer 2024

Active Learning and Importance Sampling

Summer 2022

Active Learning and Importance Sampling

Summer 2022

National Awards

NSF Graduate Research Fellow

2022-2025

Goldwater Scholar

2019

Academic All-American

2015