

# R. Teal Witter

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## Academic Positions

<b>Claremont McKenna College</b> <i>Department of Mathematical Sciences</i> Assistant Professor	<b>Claremont, CA</b>  <i>July 2025–Present</i>
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## Research Interests

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

## Education

<b>New York University</b> <i>Ph.D. in Computer Science</i> Pearl Brownstein Doctoral Research Award Advisors: Christopher Musco and Lisa Hellerstein Dissertation: Regression-based Estimators for Causal Inference and Explainable AI	<b>New York, NY</b> <i>September 2020–May 2025</i>
<b>Middlebury College</b> <i>B.A. in Mathematics, B.A. in Computer Science</i> Phi Beta Kappa, Summa Cum Laude	<b>Middlebury, VT</b> <i>February 2017–May 2020</i>

## Teaching

<b>Randomized Algorithms for Data Science</b> <i>Course Instructor</i>	<b>Middlebury CSCI 1052</b> <i>Winter 2024</i>
<b>Deep Learning</b> <i>Course Instructor</i>	<b>Middlebury CSCI 1051</b> <i>Winter 2023</i>
<b>Deep Learning</b> <i>Course Assistant</i>	<b>NYU CS-GY 6953</b> <i>Fall 2022, Spring 2023, Fall 2023</i>
<b>Algorithmic Machine Learning and Data Science</b> <i>Course Assistant</i>	<b>NYU CS-GY 6763</b> <i>Fall 2021, Spring 2022, Fall 2023</i>
<b>Machine Learning</b> <i>Course Assistant</i>	<b>NYU CS-GY 6923</b> <i>Spring 2021, Spring 2023</i>

## Preprints

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

[1] K. Arabi, R. T. Witter, C. Hegde, N. Cohen. *SEAL: Semantic Aware Image Watermarking*. 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

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- [5] C. Musco, R. T. Witter. *Provably Accurate Shapley Value Estimation via Leverage Score Sampling*.\* International Conference on Learning Representations, 2024.
- [6] 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, 2024.
- [7] 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.
- [8] 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.
- [9] M. Czekanski, S. Kimmel, R. T. Witter. *Robust and Space-Efficient Dual Adversary Quantum Query Algorithms*.\* European Symposium on Algorithms, 2023.
- [10] L. Rosenblatt, R. T. Witter. *Counterfactual Fairness Is Basically Demographic Parity*. AAAI Conference on Artificial Intelligence, 2023.
- [11] 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.
- [12] 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.
- [13] 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.
- [14] S. Kimmel, R. T. Witter. *A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs*.\* Algorithms and Data Structures Symposium, 2021.
- [15] R. T. Witter. *Backgammon is Hard*. International Conference on Combinatorial Optimization and Applications, 2021.
- [16] 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.
- [17] 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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### **Towards Trustworthy and Interpretable Machine Learning**

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

NYU-KAIST Inclusive AI Workshop	November 2023
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### **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
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### **How to Quantify Polarization in Models of Opinion Dynamics**

International Workshop on Mining and Learning with Graphs	August 2022
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### **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
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### **A Query-Efficient Quantum Algorithm for Maximum Matching on General Graphs**

International Workshop on Mining and Learning with Graphs	August 2021
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### **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
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## Service

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### **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

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### **Extracurricular Coding Club**

*Instructor*

### **Brooklyn International High School**

*Spring 2021-2023*

## Advising

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<b>Shingo Kodama</b> <i>Middlebury College '28</i>	<b>Semantic and Distortion-Free LLM Watermarks</b> <i>Spring 2025-Present</i>
<b>Syna Sachdeva</b> <i>Barnard College '26</i>	<b>Gaussian Splatting with Latent Representations</b> <i>Summer 2024</i>
<b>Jack Liu</b> <i>New York University '25</i>	<b>Latent Guidance of Large Language Models</b> <i>Spring 2024-Summer 2024</i>
<b>Xiaorui Lei</b> <i>Brooklyn International High School '22</i>	<b>Active Learning and Importance Sampling</b> <i>Summer 2022</i>
<b>Bryant Chen</b> <i>Brooklyn International High School '22</i>	<b>Active Learning and Importance Sampling</b> <i>Summer 2022</i>

## National Awards

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NSF Graduate Research Fellow	2022-2025
Goldwater Scholar	2019
Academic All-American	2015