R. Teal Witter

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Education

New York University — **New York, NY**
PhD in Computer Science — *September 2020–Present*
Advised by Lisa Hellerstein and Christopher Musco

Middlebury College — **Middlebury, VT**
BA in Mathematics, BA in Computer Science — *February 2017–May 2020*
Phi Beta Kappa

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

Deep Learning — **Middlebury CSCI 1051**
Course Instructor — *Winter 2023*

Deep Learning — **NYU CS-GY 6953**
Course Assistant — *Fall 2022, Spring 2023, Fall 2023*

Algorithmic Machine Learning and Data Science — **NYU CS-GY 6763**
Course Assistant — *Fall 2021, Spring 2022, Fall 2023*

Machine Learning — **NYU CS-GY 6923**
Course Assistant — *Spring 2021, Spring 2023*

Publications

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

[1] M. Czekanski, S. Kimmel, and R. T. Witter, "Robust and Space-Efficient Dual Adversary Quantum Query Algorithms," in *European Symposium on Algorithms*, 2023.

[2] L. Rosenblatt and R. T. Witter, "Counterfactual fairness is basically demographic parity," in *AAAI Conference on Artificial Intelligence*, 2023.

[3] 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.

[4] 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.

[5] 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.

[6] 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.

[7] R. T. Witter, "Backgammon is hard," in *International Conference on Combinatorial Optimization and Applications*, 2021.

[8] 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.

[9] 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

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: QIP 2022, ICALP 2022, TQC 2022, NeurIPS 2023, ICLR 2024
Journal Reviewing: Information Processing Letters, Theoretical Computer Science

Mentorship and Outreach

Lead weekly coding sessions at Brooklyn international High School. *Spring 2021-Spring 2023*
Advised Xiaorui Lei (BIHS '22) and Bryant Chen (BIHS '22). *Summer 2022*