Arsen Vasilyan

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Research Interests

- Computational learning theory
- Distribution learning and testing
- Computational statistics
- Sublinear algorithms

Appointments

Simons Institute for Theory of Computation at UC Berkeley May 2024 - December 2024
Research Fellow
Programs: Modern Paradigms in Generalization, Large Language Models and Transformers

Massachusetts Institute of Technology (MIT) May 2024 - August 2024
Research Specialist
Advisor: Ronitt Rubinfeld

Education

Massachusetts Institute of Technology (MIT) June 2020 - March 2024
Ph.D. Candidate in Computer Science
Advisors: Jonathan Kelner, Ronitt Rubinfeld

Massachusetts Institute of Technology (MIT) September 2019 - June 2020
M.S. in Electrical Engineering and Computer Science
Thesis: *Approximating the Noise Sensitivity of a Monotone Boolean Function*
Advisor: Ronitt Rubinfeld

Massachusetts Institute of Technology (MIT) September 2016 - June 2019
B.S. in Computer Science
Minor in Physics / Minor in Philosophy

List of Publications

Note that author order in all publications below is alphabetical, following the standard conventional practice in theoretical computer science.

Learning Intersections of Halfspaces with Distribution Shift: Improved Algorithms and SQ Lower Bounds
Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
37th Annual Conference on Learning Theory (**COLT 2024**).

Testable Learning with Distribution Shift
Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
37th Annual Conference on Learning Theory (**COLT 2024**).

An Efficient Tester-Learner for Halfspaces
Aravind Gollakota, Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
12th International Conference on Learning Representations (**ICLR 2024**).

Tester-Learners for Halfspaces: Universal Algorithms
Aravind Gollakota, Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
37th Conference on Neural Information Processing Systems (**NeurIPS 2023**).
Accepted for oral presentation (top 2.1% of accepted papers).

Agnostic Proper Learning of Monotone Functions: Beyond the Black-box Correction Barrier
Jane Lange and Arsen Vasilyan
64th IEEE Symposium on Foundations of Computer Science (**FOCS 2023**).
Invited to special issue.

Testing Distributional Assumptions of Learning Algorithms
Ronitt Rubinfeld, Arsen Vasilyan
55th ACM Symposium on Theory of Computing (**STOC 2023**)

Properly Learning Monotone Functions via Local Reconstruction
Jane Lange, Ronitt Rubinfeld, Arsen Vasilyan
63rd IEEE Symposium on Foundations of Computer Science (**FOCS 2022**)

Monotone Probability Distributions over the Boolean Cube Can Be Learned with Sublinear Samples
Ronitt Rubinfeld, Arsen Vasilyan
11th Innovations in Theoretical Computer Science Conference (**ITCS 2020**)

Approximating the Noise Sensitivity of a Monotone Boolean Function
Ronitt Rubinfeld, Arsen Vasilyan
Approximation, Randomization, and Combinatorial Optimization. Algorithms and Techniques (**APPROX/RANDOM 2019**).

Invited Talks

- Sublinear Algorithms Program, Simons Institute at UC Berrkeley *May 2024*
- Princeton Theory Seminar *February 2024*
- Toyota Technological Institute at Chicago, Junior Theorists Workshop *December 2023*
- Carnegie Melon University, Theory seminar *November 2023*
- Bar-Ilan University, Theory seminar *June 2023*
- Harvard-MIT Theory Reading Group (joint 3-hour talk with Ronitt Rubinfeld).*April 2023*
- Carnegie Melon University, Theory seminar *October 2022*
- Columbia University, Theory seminar *September 2022*
- Stanford University *February 2022*

Teaching experiences

Massachusetts Institute of Technology (MIT)
Teaching Assistant

- **6.875 [Graduate course] Cryptography and Cryptanalysis** Fall 2019
  Developed homework assignments and held weekly office hours.
- **6.UAR Advanced Undergraduate Research Program** Spring 2023
  Trained advanced undergraduate students in computer science communication skills. Ensured their research projects are on track.

Service

- **External referee**
  ACM Symposium on Theory of Computing (**STOC**), Symposium on Foundations of Computer Science (**FOCS**), Innovations in Theoretical Computer Science (**ITCS**), Symposium on Discrete Algorithms (**SODA**), International Conference on Randomization and Computation (**RANDOM**), International Colloquium on Automata, Languages, and Programming (**ICALP**), European Symposium on Algorithms (**ESA**)

Outreach

- **MIT Graduate Application Assistance Program (GAAP)** 2021 - 2023
  Mentored 1:1 underrepresented applicants to computer science program at MIT. Held meetings through the graduate application process, meeting periodically with applicants all the way up to the deadline.

Awards

- **Second Place – William A. Martin Master's Thesis Award** **Cambridge, Massachusetts**
  August 2021
- **Silver Medal – International Physics Olympiad** **Astana, Kazakhstan**
  July 2014