# Arsen Vasilyan

Austin, Texas
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## Research Interests

- Computational learning theory
- Foundations of Machine Learning
- Computational Statistics

## Appointments

**University of Texas at Austin** January 2025 - Present
**Postdoctoral Fellow**
Advisor: Adam Klivans

**Simons Institute for Theory of Computation at UC Berkeley** August 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. in Computer Science**
Thesis Title: Enhancing Learning Algorithms via Sublinear-Time Methods
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 2015 - 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.**

*Testable algorithms for approximately counting edges and triangles in sublinear time and space*
Talya Eden, Ronitt Rubinfeld, Arsen Vasilyan
17th Innovations in Theoretical Computer Science Conference (**ITCS 2026**, to appear)

*Robust Learning of Halfspaces under Log-Concave Marginals*
Jane Lange, Arsen Vasilyan
39th Conference on Neural Information Processing Systems (**NeurIPS 2025**, to appear).
**Accepted as a Spotlight presentation.**

*The Power of Iterative Filtering for Supervised Learning with (Heavy) Contamination*
Adam R. Klivans, Konstantinos Stavropoulos, Kevin Tian, Arsen Vasilyan
39th Conference on Neural Information Processing Systems (**NeurIPS 2025**, to appear).
**Accepted as a Spotlight presentation.**

*Learning Constant-Depth Circuits in Malicious Noise Models*
Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
38th Annual Conference on Learning Theory (**COLT 2025**).

*Local Lipschitz Filters for Bounded-Range Functions*
Jane Lange, Ephraim Linder, Sofya Raskhodnikova, Arsen Vasilyan
36th ACM-SIAM Symposium on Discrete Algorithms (**SODA 2025**).

*Tolerant Algorithms for Learning with Arbitrary Covariate Shift*
Surbhi Goel, Abhishek Shetty, Konstantinos Stavropoulos, Arsen Vasilyan
38th Conference on Neural Information Processing Systems (**NeurIPS 2024**).
**Accepted as a Spotlight presentation.**

*Efficient Discrepancy Testing for Learning with Distribution Shift*
G. Chandrasekaran, A. R. Klivans, Vasilis Kontonis, K. Stavropoulos, A. Vasilyan
38th Conference on Neural Information Processing Systems (**NeurIPS 2024**).

*Plant-and-Steal: Truthful Fair Allocations via Predictions*
Ilan Reuven Cohen, Alon Eden, Talya Eden, Arsen Vasilyan
38th Conference on Neural Information Processing Systems (**NeurIPS 2024**).

*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.**

*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 of SIAM Journal on Computing.**

*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
International Conference on Randomization and Computation (**RANDOM 2019**).

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## Journal Articles

*Agnostic Proper Learning of Monotone Functions: Beyond the Black-box Correction Barrier*
Jane Lange and Arsen Vasilyan
SIAM Journal on Computing, 2025.

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## Preprints

*Testing Noise Assumptions of Learning Algorithms*
Surbhi Goel, Adam R. Klivans, Konstantinos Stavropoulos, Arsen Vasilyan
Preprint arXiv:2501.09189 (2025).

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## Invited Talks

- IFML Seminar, University of Texas at Austin *January 2025*
- Joint IFML/MPG Symposium, Simons Institute at UC Berrkeley *November 2024*
- University of Michigan Theory Seminar *October 2024*
- 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 talk with Ronitt Rubinfeld). *April 2023*
- Carnegie Melon University, Theory seminar *October 2022*
- Columbia University, Theory seminar *September 2022*
- Stanford University *February 2022*

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## Teaching

**Massachusetts Institute of Technology (MIT)**
**Teaching Assistant**

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

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## 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**), The International Conference on Learning Representations (**ICLR**), Conference on Learning Theory (**COLT**), Conference on Neural Information Processing Systems (**NeurIPS**)
  NeurIPS 2025 **Outstanding reviewer**
- **Program Committee:**
  29th International Conference on Randomization and Computation (**RANDOM** 2025)

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## 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.

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## Awards

- **Dimitris N. Chorafas Foundation Thesis Award** — **Vitznau, Switzerland**, *September 2024*
- **Second Place – William A. Martin Master's Thesis Award** — **Cambridge, Massachusetts**, *August 2021*
- **Silver Medal – International Physics Olympiad** — **Astana, Kazakhstan**, *July 2014*