Maryam Aliakbarpour

Curriculum Vitae

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Research Interests

- ◇ Theoretical Computer Science
- ◇ Statistical Learning Theory
- ◇ Differential Privacy
- ◇ Sub-linear Algorithms
- ◇ Property Testing

Education

◇ **Massachusetts Institute of Technology (MIT)** — Cambridge, USA
Ph.D. in Computer Science — Sep 2015 - Sep 2020
Thesis: Distribution Testing: Classical and New Paradigms
Advisor: **Prof. Ronitt Rubinfeld**

◇ **Massachusetts Institute of Technology (MIT)** — Cambridge, USA
M.S. in Electrical Engineering and Computer Science — Sep 2013 - Sep 2015
Thesis: Learning and Testing Junta Distributions over Hypercubes
Advisor: **Prof. Ronitt Rubinfeld**

◇ **Sharif University of Technology** — Tehran, Iran
B.S. in Computer Engineering - Software — Sep 2009 - June 2013

Work Experiences

◇ Michael B. Yuen and Sandra A. Tsai **Assistant Professor** — July 2023 - present
Department of Computer Science, **Rice University**
Ken Kennedy Institute: AI, Data, and Computing for Global Impact, **Rice University**

◇ Research Fellow at **Simons Institute, UC Berkeley** — Summer 2024
Sublinear Algorithms Program

◇ **Postdoctoral** Scholar at **Boston University/Northeastern University** — Sep 2021 - June 2023

◇ **Postdoctoral** Research Associate at **UMass Amherst** — Sep 2020 - Aug 2021

◇ Visiting participant at **Simons Institute, UC Berkeley** — Fall 2020
Probability, Geometry, and Computation in High Dimensions Program

◇ Summer internship at **Google** Sunnyvale, CA, USA — Summer 2017

◇ Summer internship at **EPFL** (Ecole Polytechnique Federale de Lausanne), Lausanne, Switzerland. — Summer 2012

Publications

1. *Enhancing Feature-Specific Data Protection via Bayesian Coordinate Differential Privacy*
M. Aliakbarpour S. Chaudhuri, T. A. Courtade, A. Fallah, M. I. Jordan
Preprint
2. *Privacy in Metalearning and Multitask Learning: Modeling and Separations*
M. Aliakbarpour, K. Bairaktari, A. Smith, M. Swanberg, J. Ullman
Preprint
3. *Optimal Algorithms for Augmented Testing of Discrete Distributions*
M. Aliakbarpour, P. Indyk, R. Rubinfeld, S. Silwal

To appear in 38th Conference on Neural Information Processing Systems, **NeurIPS 2024**

4. *Optimal Hypothesis Selection in (Almost) Linear Time*
   M. Aliakbarpour, M. Bun, A. Smith
   To appear in 38th Conference on Neural Information Processing Systems, **NeurIPS 2024**
5. *Metalearning with Very Few Samples Per Task*
   M. Aliakbarpour, K. Bairaktari, G. Brown, A. Smith, J. Ullman
   37th Annual Conference on Learning Theory, **COLT 2024**
6. *Differentially Private Medians and Interior Points for Non-Pathological Data*
   M. Aliakbarpour, R. Silver, T. Steinke, J. Ullman
   15th Innovations in Theoretical Computer Science **ITCS 2024**
   Presented in Theory and Practice of Differential Privacy, **TPDP 2023**
7. *Hypothesis Selection with Memory Constraints*
   M. Aliakbarpour, M. Bun, A. Smith
   37th Conference on Neural Information Processing Systems, **NeurIPS 2023**
8. *Testing Tail Weight of a Distribution Via Hazard Rate*
   M. Aliakbarpour, A.S. Biswas, K. Ravichandran, R. Rubinfeld
   34th International Conference on Algorithmic Learning Theory, **ALT 2023**
9. *Estimation of Entropy in Constant Space with Improved Sample Complexity*
   M Aliakbarpour, A. McGregor, J. Nelson, E. Waingarten
   36th Conference on Neural Information Processing Systems, **NeurIPS 2022**
10. *Local Differential Privacy Is Equivalent to Contraction of an f-Divergence*
    S. Asoodeh, **M. Aliakbarpour**, F. Calmon
    2021 IEEE International Symposium on Information Theory, **ISIT 2021**
11. *Rapid Approximate Aggregation with Distribution-Sensitive Interval Guarantees*
    S. Macke, **M. Aliakbarpour**, I. Diakonikolas, A. Parameswaran, R. Rubinfeld
    37th IEEE International Conference on Data Engineering, **ICDE 2021**
12. *Testing Determinantal Point Processes*
    Khashayar Gatmiry, **M. Aliakbarpour**, Stefanie Jegelka
    34th Conference on Neural Information Processing Systems, **NeurIPS 2020 (Spotlight)**
13. *Testing Properties of Multiple Distributions with Few Samples*
    M. Aliakbarpour, S. Silwal
    11th Innovations in Theoretical Computer Science Conference, **ITCS 2020**
14. *Private Testing of Distributions via Sample Permutations*
    M. Aliakbarpour, I. Diakonikolas, D. Kane, R. Rubinfeld
    33rd Conference on Neural Information Processing Systems, **NeurIPS 2019**
15. *Towards Testing Monotonicity of Distributions Over General Posets*
    M. Aliakbarpour, T. Gouleakis, J. Peebles, R. Rubinfeld, A. Yodpinyanee
    32nd Annual Conference on Learning Theory, **COLT 2019**
16. *Testing Mixtures of Distributions*
    M. Aliakbarpour, R. Kumar, R. Rubinfeld
    32nd Annual Conference on Learning Theory, **COLT 2019**
17. *Differentially Private Identity and Equivalence Testing of Discrete Distributions*
    M. Aliakbarpour, I. Diakonikolas, R. Rubinfeld
    35th International Conference on Machine Learning, **ICML 2018**, pp. 169–178
18. *Sublinear-Time Algorithms for Counting Star Subgraphs via Edge Sampling*
    M. Aliakbarpour, A. S. Biswas, T. Gouleakis, J. Peebles, R. Rubinfeld, A. Yodpinyanee
    Algorithmica 2018, pp. 668–697
19. *I've Seen "Enough": Incrementally Improving Visualizations to Support Rapid Decision Making*
    S. Rahman, **M. Aliakbarpour**, H. Kong, E. Blais, K. Karahalios, A. G. Parameswaran, R. Rubinfeld
    43rd International Conference on Very Large Data Bases, **VLDB 2017**, pp. 1262–1273

20. *Learning and Testing Junta Distributions*
M. Aliakbarpour, E. Blais, R. Rubinfeld
29th Annual Conference on Learning Theory, **COLT 2016**, pp. 19–46
21. *Join of Two Graphs has a Nowhere-zero 3-flow*
S. Akbari, **M. Aliakbarpour**, N. Ghanbari, E. Nategh, H. Shahmohamad
Czechoslovak Mathematical Journal 2014, pp. 433–446
22. *Minimum flow number of complete multipartite graphs*
S. Akbari, **M. Aliakbarpour**, N. Ghanbari, E. Nategh, H. Shahmohamad
Bulletin of the Institute of Combinatorics and its Applications 2012, pp. 57–64

Honors and Awards

- ◇ Career Champion Award for the Class of 2024, Rice University — 2024
- ◇ Selected participant of **Rising Stars in EECS** — 2018
- ◇ **Neekeyfar Award**, Office of Graduate Education, MIT — 2013
- ◇ **Ranked 2nd** in Cumulative GPA — 2013
  among the students in Computer Engineering Department who started in Fall 2009,
  Sharif University of Technology
- ◇ **Ranked 9th** in Nationwide Graduate Entrance Qualification Exam — 2012
  computer engineering (artificial intelligence discipline)
  among more than 31,000 participants, Iran
- ◇ **Silver Medal** in Iranian National Olympiad in Informatics — 2008

Invited Talks

- ◇ Rice University, Department of Statistics, STAT Colloquia
- ◇ University of Texas at Austin, Computer Science Department, Theory Seminar Series — Sep 2024
- ◇ Workshop on Extroverted Sublinear Algorithms, Simons Institute, Berkeley — Jun 2024
- ◇ Workshop on Local Algorithms (WOLA), MIT — Aug 2023
- ◇ Purdue University, Theory seminar — Nov 2022
- ◇ Sublinear Algorithm Workshop, FODSI, MIT — Aug 2022
- ◇ Workshop on Differential Privacy and Statistical Data Analysis, Fields Institute — Jul 2022
- ◇ Workshop on Local Algorithms (WOLA) — Jun 2022
- ◇ Northeastern University — Nov 2021
- ◇ Boston University — Nov 2021
- ◇ Learning and Testing in High Dimensions Workshop, Simons Institute, Berkeley — Dec 2020
- ◇ Carnegie Mellon University, Theory lunch — Oct 2020
- ◇ Harvard University, DP meeting — Sep 2020
- ◇ Workshop on Local Algorithms (WOLA) — July 2020
- ◇ Georgia Tech, ARC Colloquium — Mar 2020
- ◇ University of Massachusetts Amherst — Feb 2020
- ◇ Boston University — Feb 2020
- ◇ Northeastern University — Oct 2018
- ◇ IBM Thomas J. Watson Research Center — Dec 2016

Teaching Experiences

- ◇ **Instructor**, Rice University:
  - · Graduate Seminar in Learning Theory — Fall 2023, Fall 2024
  - · Probabilistic Toolkit for Learning and Computing — Spring 2024
- ◇ **Teaching Assistant**, Massachusetts Institute of Technology:
  - · Geometric Computation — Spring 2020
  - · Introduction to Algorithms — Fall 2017
  - · Design and Analysis of Algorithms — Spring 2016, Fall 2016
- ◇ **Teaching Assistant**, Sharif University of Technology:

· For six times in Algorithms, Discrete Mathematics, Scientific and Technical Presentation.

Service work

- **Program committee**: FOCS 2024, COLT 2024, ITCS 2024, TPDP 2023, COLT 2021, ITCS 2022, COLT 2022,
- Reviewer committee: COLT 2020, NeurIPS 2020, ICLR 2021, FAccT 2022
- Reviewer and sub-reviewer for various conferences and journals in theoretical computer science and machine learning

Leadership Roles and Activities

- **Co-organizer of Applied Algorithms for Machine Learning Workshop** Jun 2024
  A workshop in Paris featuring an exceptional lineup of speakers and attracting over 80 participants to explore cutting-edge topics at the intersection of algorithms and machine learning. For more info, visit our website.
- **Co-organizer of Boston-Area Data Privacy Seminar** Sep 2021 – Dec 2022
  Jointly organized by Boston University, Northeastern University, and Harvard University, this seminar series featured speakers from diverse backgrounds discussing recent and impactful research on the foundations of data privacy and related topics.
- **Member of Resources for Easing Friction and Stress (REFS)** 2016 - 2019
  Department of Electrical Engineering and Computer Science, MIT, Cambridge, MA, USA
  REFS is a group of EECS graduate students trained as peer mediators by Conflict Management at MIT. Our role is to support the graduate community and serve as the first point of contact in dealing with stress and conflict.
- **Member of Sidney Pacific Executive Council (SPEC)** 2015 – 2016
  Sidney Pacific Graduate Community, MIT, Cambridge, MA, USA
  Elected as *Chair of the Halls* in Sidney Pacific, my graduate dormitory with over 600 residents, focusing on the health and wellness of students. I trained and led a group of graduate students, the hall councilors. Our team's goal was to build smaller communities within the dorm and ensure that every resident had someone to reach out to. Additionally, I organized several health and wellness events for the residents.

References

- **Prof. Ronitt Rubinfeld**
  Edwin Sibley Webster Professor of Electrical Engineering and Computer Science
  Massachusetts Institute of Technology (MIT)
  <ronitt@csail.mit.edu>
- **Prof. Adam Smith**
  Professor of Computer Science and Engineering, and Data Science Faculty
  Boston University
  <ads22@bu.edu>
- **Dr. Ravi Kumar** Senior Staff Research Scientist
  Google Research
  <ravi.k53@gmail.com>