

# Matthew Faw

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## Research Interests

Stochastic Optimization, Sequential Decision-Making, Fairness in Online Learning

## Education

- 2024–present **ARC Postdoctoral Fellow**, *Georgia Institute of Technology*, Atlanta, GA.
- 2018–2024 **Ph.D. ECE (Thesis: Adaptive Algorithms for Stochastic Optimization and Bandit Learning)**, *The University of Texas at Austin*, Austin, TX.  
Advisors: Sanjay Shakkottai, Constantine Caramanis.
- 2013–2017 **B.S.E. Electrical & Computer Engineering, B.S. Computer Science, A.B. Math**, *Duke University*, Durham, NC.  
Advisors: Nick Buchler, Richard Fair, Benjamin C. Lee

## Publications (Google Scholar)

### Conference Papers

- COLT 2023 “Beyond Uniform Smoothness: A Stopped Analysis of Adaptive SGD”, F<sup>=</sup>, L. Rout<sup>=</sup>, C. Caramanis, S. Shakkottai
- COLT 2022 “The Power of Adaptivity in SGD: Self-Tuning Step Sizes with Unbounded Gradients and Affine Variance”, F<sup>=</sup>, I. Tziotis<sup>=</sup>, C. Caramanis, A. Mokhtari, S. Shakkottai, R. Ward
- SIGMETRICS 2022 “Learning To Maximize Welfare with a Reusable Resource”, F<sup>=</sup>, O. Papadigenopoulos<sup>=</sup>, C. Caramanis, S. Shakkottai
- SODA 2022 “Single-Sample Prophet Inequalities via Greedy-Ordered Selection”, C. Caramanis, P. Dütting, F, P. Lazos, S. Leonardi, O. Papadigenopoulos, E. Pountourakis, R. Reiffenhäuser (alphabetical order)
- NeurIPS 2020 “Mix and Match: An Optimistic Tree-Search Approach for Learning Models from Mixture Distributions”, F, R. Sen, K. Shanmugam, C. Caramanis, S. Shakkottai

### Journal Papers

- TOCS 2017 “Computational Sprinting: Architecture, Dynamics, and Strategies”, S. Zahedi, S. Fan, F, E. Cole, B. Lee

### Working Papers

- NeurIPS 2023 Workshop “On Mitigating Affinity Bias through Bandits with Evolving Biased Feedback”, F, C. Caramanis, S. Shakkottai, J. Hoffmann
- “Multi-source Domain Adaptation Under Sparsity Constraints”, F, K. Shanmugam, C. Caramanis, S. Shakkottai

## Awards + Honors

- 2023 Dr. Brooks Carlton Fowler Endowed Presidential Graduate Fellowship in ECE, 2023-2024 academic year
- 2022 Top 10% reviewer for NeurIPS’22 and AISTATS’22, Highlighted reviewer for ICLR 2022
- 2020 NXP Foundation Fellowship, 2020-2021 academic year
- 2017 Cum Laude Graduation Honors, Duke University
- 2016 Member, Tau Beta Pi and Eta Kappa Nu Honor Societies, Duke University
- 2014 Gold medal, International Genetically Engineered Machine Competition

## Talks and Poster Presentations

### Invited Talks

- March 2024 Georgia Tech ARC Colloquium, Atlanta, GA: “The Power of Adaptivity in SGD”

## Talks

- July 2023 COLT 2023, Bangalore, India: "Beyond Uniform Smoothness: A Stopped Analysis of Adaptive SGD"
- April 2023 IFML Workshop, UW "Beyond Uniform Smoothness: A Stopped Analysis of Adaptive SGD"
- July 2022 COLT 2022, London, UK: "The Power of Adaptivity in SGD: Self-Tuning Step Sizes with Unbounded Gradients and Affine Variance"
- June 2022 SIGMETRICS 2022, IIT Bombay, Mumbai, IN: "Learning To Maximize Welfare with a Reusable Resource"
- April 2022 Machine Learning Lab Research Symposium, UT Austin: "The Power of Adaptivity in SGD: Self-Tuning Step Sizes with Unbounded Gradients and Affine Variance"
- January 2022 SODA 2022, Virtual: "Single Sample Prophet Inequalities via Greedy-Ordered Selection"

## Poster Presentations

- October 2022 Joint IFML/Data-Driven Decision Processes Workshop, Simons Institute, UC Berkeley, "The Power of Adaptivity in SGD: Self-Tuning Step Sizes with Unbounded Gradients and Affine Variance"
- December 2020 NeurIPS 2020, Virtual, "Mix and Match: An Optimistic Tree-Search Approach for Learning Models from Mixture Distributions"
- November 2019 Texas Wireless Summit, UT Austin, "Mix and Match: An Optimistic Tree-Search Approach for Learning Models from Mixture Distributions"

## Conference Reviewing

2021-Present AISTATS, ALT, ICLR, ICML, JMLR, NeurIPS

## Industry Experience

- June-Aug 2024 **Ph.D. Student Researcher**, *Google Research*, Mountain View, CA.
- June'17-July'18 **Software Engineer**, *Verato*, McLean, VA.
- May-Aug 2016 **Software Engineering Intern**, *Stateflow Semantics*, *MathWorks*, Natick, MA.

## Undergraduate Research Experience

- Jan-Dec 2016 **Datacenter Architecture**, *Advisor: Dr. Benjamin Lee*, Duke University.
- Jan-Dec 2015 **Microfluidics**, *Advisor: Dr. Richard Fair*, Duke University.
- May-Nov 2014 **Synthetic Biology**, *Advisor: Dr. Nick Buchler*, Duke University.

## Teaching Experience

- UT Austin EE 460J Data Science Lab TA
- Duke CS 308 Software Design and Implementation TA, ECE 280 Signals & Systems TA, Synthetic Biology House Course Co-Instructor

## Graduate Coursework

- UT Austin Probability & Stochastic Processes, Advanced Probability, Stochastic Processes I, Theoretical Statistics, Online Learning, Large Scale Optimization I & II, Combinatorial Optimization, Sublinear Algorithms, Markov Chains & Mixing Times, Combinatorics & Graph Theory, Analysis & Design of Communication Networks

## Technical Skills

- Programming Java, Python (PyTorch, Sklearn), C/C++, JavaScript
- Infrastructure Kubernetes, AWS, Google Cloud, Mongo, Solr

## References

Sanjay Shakkottai, UT Austin, [sanjay.shakkottai@utexas.edu](mailto:sanjay.shakkottai@utexas.edu)  
Constantine Caramanis, UT Austin, [constantine@utexas.edu](mailto:constantine@utexas.edu)  
Aryan Mokhtari, UT Austin, [mokhtari@austin.utexas.edu](mailto:mokhtari@austin.utexas.edu)