Advait Parulekar

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Education

PhD, Dept. of Electrical and Computer Engineering, UT Austin, January 2020-Present

- Focus on Learning Theory - Representation Learning, Bandits, Active sub-sampling for Regression.

BS Computer Engineering, Texas A&M University, August 2015-May 2019

- Graduated summa cum laude with departmental honors, minor in Mathematics

Publications

InfoNCE Loss Provably Learns Cluster-Preserving Representations.
Advait Parulekar, Liam Collins, Karthikeyan Shanmugam, Aryan Mokhtari, Sanjay Shakkottai.
Conference on Learning Theory (**COLT 2023**), Bengaluru, India, July 2023.

PAC Generalization via Invariant Representations.
Advait Parulekar, Karthikeyan Shanmugam, Sanjay Shakkottai.
Proceedings of the 40th International Conference on Machine Learning (**ICML 2023**), Honolulu, HI, July 2023.

Regret Bounds for Stochastic Shortest Path Problems with Linear Function Approximation.
Daniel Vial, **Advait Parulekar**, Sanjay Shakkottai and R. Srikant.
Proceedings of the 39th International Conference on Machine Learning (**ICML 2022**), Baltimore, MD, July 2022.

Improved Algorithms for Misspecified Linear Markov Decision Processes.
Daniel Vial, **Advait Parulekar**, Sanjay Shakkottai and R. Srikant.
Proceedings of the 25th International Conference on Artificial Intelligence and Statistics (**AISTATS 2022**), Virtual Conference, April 2022.

L1 Regression with Lewis Weights Subsampling.
Aditya Parulekar, **Advait Parulekar**, Eric Price.
The International Conference on Randomization and Computation (**RANDOM 2021**), Virtual Conference, August 2021

A quadratically convergent iterative scheme for locating conical degeneracies in the spectra of parametric self-adjoint matrices.
Gregory Berkolaiko, **Advait Parulekar**. *(alphabetical order)*
SIAM Journal on Matrix Analysis and Applications, 2021, Vol. 42, No. 1 : pp. 224-242.

Preprints

In-Context Learning with Transformers: Softmax Attention Adapts to Function Lipschitzness.
Liam Collins*, **Advait Parulekar***, Aryan Mokhtari, Sujay Sanghavi, Sanjay Shakkottai. *(co-first authors)*
https://arxiv.org/abs/2402.11639

A Theoretical Justification for Image Inpainting using Denoising Diffusion Probabilistic Models.
Litu Rout, **Advait Parulekar**, Constantine Caramanis, Sanjay Shakkottai.
https://arxiv.org/abs/2302.01217

Stochastic Linear Bandits with Protected Subspace. **Advait Parulekar**, Soumya Basu, Aditya Gopalan, Karthikeyan Shanmugam, Sanjay Shakkottai. https://arxiv.org/abs/2011.01016

Competitions

2021 NSF Graduate Research Fellowship Program competition, Honorable Mention

2018 William Lowell Putnam Math Contest, Honorable Mention

2015 USA Physics Olympiad Team Member

2013 Indian Math Olympiad Training Camp

Graduate Coursework

Theory of Computation, Online Learning, Methods in Applied Mathematics (Functional Analysis), Stochastic Geometry, Stochastic Approximation, Advanced Probability, Sub-linear Algorithms, Combinatorial Optimization, Markov Chains and Mixing Times, Convex Optimization, Statistical Machine Learning, Game Theory, Information Theory, Cryptography, Randomized Algorithms, Algorithms in Structural Bio-informatics.

Reviewing

AISTATS '21, AISTATS '22, ICML '22, RANDOM '22, NeurIPS '22

Experience

Research Intern - Machine Learning and Optimization team
Google Research India Bengaluru, India (June 2023 - Sept 2023)

- Studied simplicity bias in wide shallow neural networks.

2022 IPhO Grader
Zurich, Switzerland (July 2022)

Research Assistant
Dept. of Mathematics, advisor: Prof. Gregory Berkolaiko Texas A&M University (Aug 2019-Dec 2019)

- Spectral Theory

Curriculum Development
Art of Problem Solving (Aug 2019)

- Writing handouts for PhysicsWOOT and grader for PhysicsWOOT.

SMaRT Camp Counsellor
Dept. of Mathematics Texas A&M University (Summer 2017, Summer 2018, Summer 2019)

- Helped teach number theory, modern algebra, linear algebra, to high school students.
- https://github.com/advaitparulekar/Inv-Radon-Transform

Peer Teacher (Undergraduate TA)
Dept. of Electrical Engineering & Dept. of Computer Science Texas A&M University (Spring 2019)

- "Introduction to Computer Systems," "Structured Programming in C," "Programming Studio", "Signals and Systems," "Electronics," "Electrical Circuit Theory," and "Random Signals and Systems."

Other

- **Languages:** C++, Python, Java, C, JavaScript
- **Computing:** MATLAB, Mathematica