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

Preprints

InfoNCE Loss Provably Learns Cluster-Preserving Representations. **Advait Parulekar**, Liam Collins, Karthikeyan Shanmugam, Aryan Mokhtari, Sanjay Shakkottai. https://arxiv.org/abs/2302.07920

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

PAC Generalization via Invariant Representations. **Advait Parulekar**, Karthikeyan Shanmugam, Sanjay Shakkottai. https://arxiv.org/abs/2205.15196

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

Publications

Regret Bounds for Stochastic Shortest Path Problems with Linear Function Approximation. Daniel Vial, **Advait Parulekar**, Sanjay Shakkottai and R. Srikant. To appear in the 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. To appear in Proceedings of the 25th International Conference on Artificial Intelligence and Statistics (AISTATS), Virtual Conference, April 2022.

L1 Regression with Lewis Weights Subsampling. Aditya Parulekar, **Advait Parulekar**, Eric Price. The International Conference on Randomization and Computation (RANDOM), 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***. SIAM Journal on Matrix Analysis and Applications, 2021, Vol. 42, No. 1 : pp. 224-242. *(* = Authors listed in alphabetical order)*

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

Other

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

Experience

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."