Abhin Shah

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Education

Massachusetts Institute of Technology (MIT) *2018—2024*
Ph. D., in Electrical Engineering and Computer Science
Advisors: *Prof. Devavrat Shah, Prof. Gregory W. Wornell, & Prof. Alberto Abadie*

Indian Institute of Technology, Bombay (IIT Bombay) *2014—2018*
Bachelor of Technology in Electrical Engineering with Honors
Minor in Computer Science

Research Interests

Causal Inference, Statistical Inference, Algorithmic Fairness, Differential Privacy

Internship Experience

Google Research with Johannes Ballé, Lucas Theis, and Peter Kairouz link *Summer 2021*
- Devised techniques to jointly and optimally compress as well as privatize data

IBM Research with Kush Varshney, Kartik Ahuja, Karthikeyan Shanmugam, Dennis Wei, and Amit Dhurandhar link, link *Summer 2020*
- Devised techniques to perform robust causal effect estimation from observational data

Selected Awards And Achievements

Best Presentation, Laboratory of Information & Decision Systems (LIDS) Student Conference, MIT *2024*
Presidential Graduate Fellowship, MIT *2018—19*
Undergraduate Research Award for exemplary contribution towards research, IIT Bombay *2017*
Institute Academic Prize for excellent academic performance in the junior year, IIT Bombay *2017*
Best Project for Social Cause at Technical, Research, and Development Exposition, IIT Bombay *2015*
All India Rank 126 out of 1.4 million, IIT Joint Entrance Exam Advanced *2014*
Bronze medal, 32nd Annual Mathematics Olympiad, IIT Bombay *2013*

News Coverage

Research on "Fair selective regression" featured in MIT News article, "A technique to improve both fairness and accuracy in artificial intelligence" *July 2022*

Pre-Prints

(† denotes alphabetical ordering; title is hyperlinked to the online pdf of the paper)

1. Alberto Abadie†, Anish Agarwal, Raaz Dwivedi, **Abhin Shah**, "Doubly Robust Inference in Causal Latent Factor Models", *under review at ACM Conference on Economics and Computation (EC), full version in preparation for submission to Econometrica*
2. **Abhin Shah**, Raaz Dwivedi, Devavrat Shah, Gregory W. Wornell "On counterfactual inference with unobserved confounding", *NeurIPS 2022 Workshop on Causality for Real-world Impact (CML4Impact), full version under review at Operations Research*
3. **Abhin Shah**, Devavrat Shah, Gregory W. Wornell, "On computationally efficient learning of exponential family distributions", *under review at IEEE Transactions on Information Theory*

Selected Publications

(⋆ denotes equal contribution; title is hyperlinked to the online pdf of the paper)

1. **Abhin Shah**, Maohao Shen, Jongha Jon Ryu, Subhro Das, Prasanna Sattigeri, Yuheng Bu, Gregory W. Wornell, "Group fairness with uncertainty in sensitive attributes", *IEEE International Symposium on Information Theory (ISIT)*, US Patent Application, 18/503166 *2024*
2. **Abhin Shah**, Karthikeyan Shanmugam, Murat Kocaoglu, "Front-door adjustment beyond Markov equivalence with limited graph knowledge", *Conference on Neural Information Processing Systems (NeurIPS)* *2023*

3. **Abhin Shah***, Yuheng Bu*, Joshua Ka-Wing Lee, Subhro Das, Rameswar Panda, Prasanna Sattigeri, Gregory W. Wornell, "Selective regression under fairness criteria", *International Conference on Machine Learning (ICML)*, *2022*
4. **Abhin Shah**, Wei-Ning Chen, Johannes Ballé, Peter Kairouz, Lucas Theis, "Optimal compression of locally differentially private mechanisms", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, *2022*
5. **Abhin Shah**, Karthikeyan Shanmugam, Kartik Ahuja, "Finding valid adjustments under non-ignorability with minimal DAG knowledge", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, *2022*
6. **Abhin Shah**, Devavrat Shah, Gregory W. Wornell, "A computationally efficient method for learning exponential family distributions", *Conference on Neural Information Processing Systems (NeurIPS)* *2021*
7. **Abhin Shah**, Kartik Ahuja, Karthikeyan Shanmugam, Dennis Wei, Kush Varshney, Amit Dhurandhar, "Treatment effect estimation using invariant risk minimization", *IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*, *2021*
8. **Abhin Shah**, Devavrat Shah, Gregory W. Wornell, "On learning continuous Markov random fields", *International Conference on Artificial Intelligence and Statistics (AISTATS)*, Oral Presentation *2021*
9. **Abhin Shah**, Sai Vinjanampathy, Bhaskaran Muralidharan, "Classical information driven quantum dot thermal machines", *Annals of Physics* *2018*

Working papers

1. "Learning counterfactual distribution under unobserved confounding with exponential family" with Raaz Dwivedi, Devavrat Shah, and Gregory W. Wornell
2. "A unified view on learning exponential family distributions via noise-contrastive estimation" with Jongha Jon Ryu and Gregory W. Wornell
3. "Treatment effect estimation beyond sequential ignorability: An application to clinical healthcare" with Shalmali Joshi and Karthikeyan Shanmugam

Academic Services

Scientific Meetings

- Chair, Social Aspects: Accountability, Transparency and Interpretability Session, International Conference on Machine Learning *2022*

Committees

- Student Search Advisory Group, MIT EECS Faculty Search *2023*

Mentoring Activities

- MIT EECS Graduate Application Assistance Program (GAAP) for *underrepresented applicants* *2022—23*
- MIT EECS for *MEng* students *2022—23*
- IIT Bombay Student Mentoring Program (ISMP) for *incoming undergraduates* *2017—18*
- IIT Bombay Academic Mentoring Program (DAMP) for *sophomores & juniors* *2016—18*

Reviewing Activities

- **Top-10% reviewer** — ICML 2022, AISTATS 2022
- NeuIPS (2023, 2022, 2021), ICML (2023, 2022), AISTATS (2022, 2021), ACIC 2023, ISIT 2023, JSAIT 2020

References

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