# Sushant Agarwal

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**Research Interests:** Trustworthy Machine Learning (Fairness, Interpretability, Privacy, Robustness)

## EDUCATION

**Northeastern University**, USA                                                                                 *Current*
PhD in Computer Science, Advisors: Ravi Sundaram, Rajmohan Rajaraman

**University of Waterloo**, Canada                                                                          *April 2020*
Master's (Research) in Computer Science, Advisor: Shai Ben-David

**Chennai Mathematical Institute**, India                                                                  *July 2017*
Bachelor's in Math and Computer Science

## PUBLICATIONS (CITATIONS: 250, H-INDEX: 7)

*Authors are ordered alphabetically, unless specified. CO = contribution order, * = Equal contribution*

- Optimal Fair Learning Robust to Adversarial Distribution Shift
  Sushant Agarwal, Amit Deshpande, Rajmohan Rajaraman, Ravi Sundaram
  **ICML** 2025 [pdf]

- Aggregating Data for Optimal Learning
  Sushant Agarwal, Yukti Makhija, Rishi Saket, Aravind Raghuveer (CO)
  **UAI** 2025 (Oral presentation) [pdf]

- Private Mean Estimation with User-Level Differential Privacy
  Sushant Agarwal, Gautam Kamath, Mahbod Majid, Argyris Mouzakis, Rose Silver, Jon Ullman
  **SODA** 2024 [pdf]

- On the Power of Randomization in Fair Classification and Representation
  Sushant Agarwal, Amit Deshpande
  ACM **FAccT** 2022 [pdf].

- Towards the Unification and Robustness of Post-hoc Explanations
  Sushant Agarwal, Shahin Jabbari, Chirag Agarwal*, Sohini Upadhyay*, Hima Lakkaraju, Steven Wu (CO)
  **ICML** 2021 (Spotlight presentation) [pdf], **FORC** 2022 (non-archival) [pdf]

- Open Problem: Are all VC-classes CPAC learnable?
  Sushant Agarwal, Nivasini A., Shai Ben-David, Tosca Lechner, Ruth Urner
  **COLT** 2021 [pdf].

- On Trade-offs between Fairness, Interpretability, and Privacy in Classification
  Sushant Agarwal
  Master's Thesis [pdf], **AAAI** 2021 workshop [pdf], **IJCAI** 2021 workshop [pdf 1][pdf 2].

- On Learnability with Computable Learners
  Sushant Agarwal, Nivasini A., Shai Ben-David, Tosca Lechner, Ruth Urner
  **ALT** 2020 [pdf].

- Impossibility Results for Fair Data Representation [pdf]
  Tosca Lechner, Shai Ben-David, Sushant Agarwal, Nivasini A. (contribution order)

## EXPERIENCE

**Google Deepmind**, *Research Intern under Rishi Saket & Aravind Raghuveer*                    *May '24 - Aug '24*

- Conducted research on optimal strategies for learning via data aggregation, leading to a paper at UAI 2025.

**Microsoft Research**, *Research Intern under Amit Deshpande*                    *Jun '21 - Jan '22*

- Conducted research on problems in fair machine learning, leading to a paper at ACM FAccT 2022.

**Harvard University**, *Research Assistant under Hima Lakkaraju*                    *Aug '20 - Feb '21*

- Worked on problems in explainable machine learning, leading to papers at ICML 2021, and FORC 2022.

**University of Waterloo**, *Research Assistant under Gautam Kamath*                    *Feb '22 - Aug '22*

- Empirically measured the privacy of various machine learning algorithms using membership inference attacks.

**National University of Singapore**, *Research Intern under Rahul Jain*                    *May '16 - July '16*

- Conducted research in quantum complexity theory.

**Codechef, DirectI**, *Software Intern*                    *December '14 - April '15*

- Wrote solutions and editorials in Python and C++ for competitive programming problems on their platform.

**Teaching Assistant**

- *Courses at Northeastern:* Algorithms, Algorithms and Data
- *Courses at UWaterloo:* Statistical Machine Learning, Introduction to Artificial Intelligence, Introduction to Logic, Algorithmic Problem Solving, Data Structures, Algorithm Design, Introduction to Computer Science
- *Courses at CMI:* Design & Analysis of Algorithms, Discrete Mathematics, Advanced Programming (Python)

## SCHOLASTIC ACHIEVEMENTS

- Coach of the Northeastern ACM-ICPC team for the world finals in Bangladesh (November, 2022).
- Recipient of the Vector AI Institute Scholarship.
- Recipient of the University of Waterloo Graduate Scholarship.
- Recipient of the INSPIRE Scholarship by Dept. of Science and Tech, Govt. of India.
- Recipient of the CMI Undergraduate Scholarship.
- Reviewer for COLT, NeurIPS, AISTATS.
- Stood 2nd in Gujarat state in the Indian National Maths Olympiad 2012.
- Obtained a rank in top 0.25 percent of India in JEE Advanced 2014.
- Was among 275 students across India to clear Zonal Informatics Olympiad 2013.

## RELEVANT COURSEWORK

**Machine Learning**: Statistical Foundations of ML, Fairness and Interpretability in ML, Privacy in Data Science, Adversarial ML, Deep Learning for Discrete Optimization, Reinforcement Learning, Theory of Clustering, Data Mining and ML, Optimization for Data Science, AI: Law, Ethics & Policy.

**CS Theory**: Complexity Theory, Advanced Algorithms, Advanced Combinatorics & Probabilistic Methods, Topics in Graph Theory, Cryptography, Theory of Computation, Game Theory, Games on Graphs

**Mathematics:** Linear Algebra, Group Theory, Rings & Fields, Calculus (1, 2, & 3), Real Analysis, Complex Analysis, Differential Equations, Topology, Probability Theory, Discrete Mathematics

**Programming:** Programming in Python, Functional Programming, Concurrent Programming

## TECHNICAL STRENGTHS

**Programming:** Python, C++, Haskell, ML frameworks like Pytorch & Tensorflow