Anand Brahmbhatt

Princeton University
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Google Scholar

Education

Princeton University *Aug 2024 - present*
PhD student in Computer Science and Engineering **GPA: 4.0/4.0**
Advisors: Prof. Elad Hazan **Gordon Y.S. Wu Fellow**

Indian Institute of Technology Delhi *2018 - 2022*
B.Tech in Computer Science and Engineering **GPA: 9.685/10**
Advisors: Prof. Parag Singla & Prof. Mausam **Department Rank 5**

Work Experience

Google Research India *Jul 2022 - Jul 2024*
Pre-Doctoral Researcher
Advisors: Dr. Rishi Saket & Dr. Aravindan Raghuveer

Adobe Research *May 2021 - Aug 2021*
Research Intern
Advisors: Dr. Shiv Saini & Dr. Atanu R Sinha

Publications & Patents

Conference and Journal Publications

* - equal contribution, # - alphabetical

1. **PAC Learning Linear Thresholds from Label Proportions** **[C.1]**
   Anand Brahmbhatt*, Rishi Saket* and Aravindan Raghuveer.
   Spotlight *@ Neural Information Processing Systems (**NeurIPS**), 2023*
2. **LLP-Bench: A Large Scale Tabular Benchmark for Learning from Label Proportions** **[C.2]**
   Anand Brahmbhatt*, Mohith Pokala*, Rishi Saket and Aravindan Raghuveer.
   *International Conference on Information and Knowledge Management (**CIKM**), 2024*
3. **Measures of Closeness to Cordiality for Graphs** **[J.1]**
   Anand Brahmbhatt#, Kartikeya Rai# and Amitabha Tripathi#.
   Discrete Applied Mathematics Volume 370, 31 July 2025, Pages 157-166

Preprints

1. **A New Approach to Controlling Linear Dynamical Systems** **[P.1]**
   Anand Brahmbhatt#, Gon Buzaglo#, Sofiia Druchyna# and Elad Hazan#.
   arXiv:2504.03952, 2025
2. **Label Differential Privacy via Aggregation** **[P.2]**
   Anand Brahmbhatt, Rishi Saket, Shreyas Havaldar, Anshul Nasery and Aravindan Raghuveer.
   arXiv:2310.10092, 2023
3. **Towards Fair and Calibrated Models** **[P.3]**
   Anand Brahmbhatt, Vipul Rathore, Mausam and Parag Singla.
   B.Tech Project, Computer Science, IIT Delhi, 2021 - 22; arXiv:2310.10399

Patents

1. **Cloud-Based Resource Allocation Using Meters** **[Pat.1]**
   Atanu R Sinha, Shiv Kumar Saini, Sapthotharan Nair, Saarthak Marathe,
   Manupriya Gupta, **Anand Brahmbhatt**, Ayush Chauhan.
   US Patent number 20230259403, 2023

Awards and Honors

- Awarded the prestigious **Gordon Y.S. Wu Fellowship** for incoming graduate students at Princeton University. *2024*
- **Department Rank 5** amongst 90+ students in the CSE Department at IIT Delhi. *2018 - 2022*
- **All India Rank 917** in JEE Advanced (IIT-JEE) 2018 among 150,000 candidates. *2018*
- Awarded KVPY Fellowship from Government of India - **All India Rank 514**. *2018*
- Awarded Certificate of Merit for being in **Institute Top 7%** in semesters I, II, III and VI at IIT Delhi. *2018 - 2022*

Research Projects

Efficient Online Non-Stochastic Control *Princeton University*
Advisors: Prof. Elad Hazan *Jan 2025 - ongoing*

- Proposed a new method for controlling linear dynamical systems with **adversarial** disturbances and cost functions.
- Achieved regret guarantees matching prior work under worst-case disturbances.
- Improved running time dependence from polynomial to **polylogarithmic** in the inverse of the stability margin. **[P.1]**

Algorithms for Aggregated Data *Google Research India*
Advisors: Dr. Rishi Saket & Dr. Aravindan Raghuveer

❖ **Learning from Label Proportions (LLP) with Linear Thresholds (LTFs)** *Sep 2022 - Feb 2023*

- Studied the **NP-Hard LLP with LTF** problem after imposing realistic **distributional assumptions**.
- Proposed a **PCA** based algorithm to PAC learn LTFs (in this relaxed case) with **polynomial sample complexity**.
- Work presented as **Spotlight paper (top 3% of all submissions)** at NeurIPS 2023. **[C.1]**

❖ **Aggregation algorithms for Differential Privacy** *Feb 2023 - Sep 2023*

- Studied the implications of random aggregation to attain **label differential privacy** (label DP).
- Suggested two aggregation methods for label DP: one **without noise**, the other with **minimal additive noise**.
- Established the dependence of privacy and utility on bag size and number of bags for both mechanisms. **[P.2]**

❖ **Benchmark for Learning from Label Proportions (LLP)** *Jul 2022 - May 2023*

- Created a **benchmark of LLP datasets** by Criteo CTR prediction dataset using different realistic techniques.
- Introduced **metrics** to assess **LLP dataset learnability** and demonstrated benchmark diversity using these metrics.
- Evaluated **9 SOTA LLP techniques** on our benchmark and provided insights to aid future exploration. **[C.2]**

Bias Amplification in Deep Networks *B.Tech Project, IIT Delhi*
Advisors: Prof. Parag Singla & Prof. Mausam *Sep 2022 - Feb 2023*

- Proved that **Proportional-Equality Definition** is an implication of **group-wise calibration**.
- Posited modifications of existing calibration techniques to attain group-wise calibration.
- Analysed tradeoffs of these techniques between fairness and calibration. **[P.3]**

Fairer Cloud Resource Allocation *Adobe Research*
Advisors: Dr. Shiv Saini & Dr. Atanu R Sinha *May 2021 - Aug 2021*

- Designed a **Shapley-Value** based approach for fairer cloud resource allocation using historic meter (usage metrics) data.
- Presented a fresh method for pinpointing the **most suitable meters** for resource allocation.
- Identified resource under-utilization by modelling ideal utilization on internal Adobe usage data. **[Pat.1]**

Quantifying Closeness to Cordiality of Graphs *Summer Research Project, IIT Delhi*
Advisor: Prof. Amitabha Tripathi *Apr 2020 - Jul 2020*

- Proposed two measures of **distance from cordiality** for graphs.
- Computed these measures or bounds on these measures for general classes of graphs.
- Proved an overarching theorem of bound on these measures under graph join operations. **[J.1]**

Relevant Courses

Mathematics	Real & Complex Analysis, Probability & Stochastic Processes, Linear Algebra & Differential Equations, Calculus
Computer Science	Theoretical Machine Learning, Advanced Algorithm Design, Discrete Mathematical Structures, Theory of Computation, Analysis & Design of Algorithms, Machine Learning, Artificial Intelligence, Natural Language Processing, Database Management Systems, Data Structures & Algorithms, Operating Systems, Computer Networks
Electrical Engineering	Signal & Systems, Computer Architecture, Digital Logic & System Design

Extra Curricular Activities

- **Academic Mentor** for the introductory Applied Mechanics course at IIT Delhi. *Jul 2019 - Dec 2019*
- Board of Student Welfare **Student Mentor** to four incoming freshmen at IIT Delhi. *2020-2022*