

Anand Brahmhatt

Google Research India

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EDUCATION

Indian Institute of Technology Delhi

B.Tech in Computer Science and Engineering

Advisors: Prof. Parag Singla and Prof. Mausam

2018 - 2022

GPA: 9.687/10

WORK EXPERIENCE

Google Research India

Pre-Doctoral Researcher

Advisors: Dr. Rishi Saket & Dr. Aravindan Raghuvier

Description: Worked on privacy and learnability of aggregated data.

Jul 2022 - present

Adobe Research

Research Intern

Advisors: Dr. Shiv Saini & Dr. Atanu R Sinha

Description: Worked on designing fairer methods for cloud-based resources allocation.

May 2021 - Aug 2021

PUBLICATIONS & PATENTS

Conference Publications

* - equal contribution

1. **PAC Learning Linear Thresholds from Label Proportions.**

[NeurIPS'23]

Anand Brahmhatt*, Rishi Saket* and Aravindan Raghuvier.

Spotlight @ Neural Information Processing Systems (NeurIPS), 2023.

Preprints

3. **Label Differential Privacy via Aggregation.**

[Preprint-1]

Anand Brahmhatt, Rishi Saket, Shreyas Havaldar, Anshul Nasery and Aravindan Raghuvier.

arXiv: , 2023 (under review @ ITCS 2024).

2. **LLP-Bench: A Large Scale Tabular Benchmark for Learning from Label Proportions.**

[Preprint-2]

Anand Brahmhatt*, Mohith Pokala*, Rishi Saket and Aravindan Raghuvier.

arXiv: , 2023.

1. **Measures of Closeness to Cordiality for Graphs.**

[Preprint-3]

Amithbha Tripathi, Anand Brahmhatt and Kartikeya Rai.

preprint , 2023.

Patents

1. **Cloud-Based Resource Allocation Using Meters.**

[Patent'23]

Atanu R Sinha, Shiv Kumar Saini, Sapthotharan Nair, Saarthak Marathe,

Manupriya Gupta, Anand Brahmhatt, Ayush Chauhan

US Patent number 20230259403, 2023.

Undergraduate Thesis

1. **Towards Fair and Calibrated Models.**

[Preprint-4]

Anand Brahmhatt, Vipul Rathore, Parag Singla and Mausam

B.Tech Project, Computer Science and Engineering, IIT Delhi, 2021 - 22 (under review @ AAAI 2024).

AWARDS AND HONORS

- **Department Rank 5** amongst 90+ students in the Computer Science and Engineering Department at IIT Delhi.

- **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.

RESEARCH PROJECTS

Algorithms for Aggregated Data

Google Research India

Advisors: Dr. Rishi Saket & Dr. Aravindan Raghuvier

- **Learnability of Linear Thresholds (LTFs) from Label Proportions** 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 to be presented as **Spotlight paper (top 3% of all submissions)** at NeurIPS 2023. [NeurIPS'23]
- **Aggregation algorithms for Differential Privacy** Feb 2023 - Sep 2023
 - Studied the implications of random aggregation the **label differential privacy** (label DP).
 - Proposed two aggregation mechanisms to attain label DP with **no/little additive noise** respectively.
 - Established the dependence of privacy and utility on bag size and number of bags for both mechanisms. [Preprint-1]
- **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.
 - Proposed metrics for learnability of LLP datasets and exhibited the diversity of our benchmark across them.
 - Evaluated 9 SOTA LLP techniques on our benchmark and provided insights to aid future exploration. [Preprint-2]

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.
- Proposed a novel method to **identify best meters** for resource allocation.
- Identified resource under-utilization by modelling ideal utilization on internal Adobe usage data. [Patent'23]

Bias Amplification in Deep Networks

B.Tech Project, IIT Delhi

Advisors: Prof. Parag Singla and Prof. Mausam

Sep 2022 - Feb 2023

- Proved that **Proportional-Equality Definition** is an implication of **group-wise calibration**.
- Proposed modification of calibration techniques to attain group-wise calibration.
- Analysed tradeoffs of these techniques between fairness and calibration. [Preprint-4]

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. [Preprint-3]

RELEVANT COURSES

Mathematics

Real & Complex Analysis, Probability & Stochastic Processes, Discrete Mathematical Structures, Linear Algebra & Differential Equations, Calculus.

Computer Science

Theory of Computation, Analysis and Design of Algorithms, Machine Learning, Artificial Intelligence, Natural Language Processing, Database Management Systems, Data Structures and Algorithms, Operating Systems, Computer Networks.

Electrical Engineering

Signal and Systems, Computer Architecture, Digital Logic and System Design.

EXTRA CURRICULAR ACTIVITIES

- **Academic Mentor** for Applied Mechanics at IIT Delhi. Jul 2019 - Dec 2019
- **Mentored** four undergraduate students in the Computer Science & Engineering Department at IIT Delhi. 2020-2022