

Anand Brahmhatt

Princeton University

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EDUCATION

Princeton University

PhD student in Computer Science and Engineering

Advisor: [Prof. Elad Hazan](#)

Research Focus: Dynamical Systems — Control for **robotics** and learning for **LLM design**.

Aug 2024 - present

GPA: **3.925/4.0**

Gordon Y.S. Wu Fellow

Indian Institute of Technology Delhi

B.Tech in Computer Science and Engineering

Advisors: [Prof. Parag Singla](#) & [Prof. Mausam](#)

2018 - 2022

GPA: **9.685/10**

Department Rank 5

WORK EXPERIENCE

Google DeepMind

Pre-Doctoral Researcher

Advisors: [Dr. Rishi Saket](#) & [Dr. Aravindan Raghuv](#)

Research Focus: **Aggregated Data** – Learning Algorithms, Privacy Quantification, Benchmark Development.

Jul 2022 - Jul 2024

Adobe Research

Research Intern

Advisors: [Dr. Shiv Saini](#) & [Dr. Atanu R Sinha](#)

Research Focus: Designing fair and efficient **Cloud Resource Allocation** mechanisms.

May 2021 - Aug 2021

RESEARCH PROJECTS

Efficient Learning and Control of Dynamical Systems

Advisors: [Prof. Elad Hazan](#)

Princeton University

Jan 2025 – ongoing

❖ Spectral Learning of Non-linear Dynamical Systems

May 2025 – Aug 2025

- Modeled **next-token prediction** as learning non-linear language dynamics to inspire provable **LLM design**.
- Utilized a **spectral learning algorithm** independent of hidden dimension to learn non-linear dynamical systems.
- Achieved the **first theoretical result** for universally learning of non-linear dynamics, extending beyond local approximations used in prior work. **[P.1]**

❖ Efficient Online Adversarial Control of Linear Dynamical Systems (LDSs)

Jan 2025 - May 2025

- Developed algorithms for controlling LDSs that adapt to **adversarial noise** in **real time**, with applications to robotics.
- Achieved **optimal regret (performance)** with **exponentially faster runtime** in the full observation setting. **[P.2]**
- Extended results to the more challenging **partial observation** setting; accepted to **NeurIPS 2025**. **[C.1]**

Algorithms for Aggregated Data

Advisors: [Dr. Rishi Saket](#) & [Dr. Aravindan Raghuv](#)

Google Research India

❖ 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 **Principal Component Analysis** based algorithm that PAC learns LTFs with **polynomial samples**.
- Work presented as **Spotlight paper (top 3% of all submissions)** at **NeurIPS 2023**. **[C.2]**

❖ 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.3]**

❖ 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.3]**

Fairer Cloud Resource Allocation

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

Adobe Research
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

Advisor: Prof. Amitabha Tripathi

Summer Research Project, IIT Delhi
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]**

PUBLICATIONS & PATENTS

Conference and Journal Publications

* - equal contribution, # - alphabetical

- Efficient Spectral Control of Partially Observed Linear Dynamical Systems** **[C.1]**
Anand Brahmabhatt[#], G. Buzaglo[#], S. Druchyna[#] and E. Hazan[#]. *NeurIPS*, 2025.
- PAC Learning Linear Thresholds from Label Proportions** **[C.2]**
Anand Brahmabhatt^{*}, R. Saket^{*} and A. Raghuveer. *Spotlight @ NeurIPS*, 2023.
- LLP-Bench: A Large Scale Tabular Benchmark for Learning from Label Proportions** **[C.3]**
Anand Brahmabhatt^{*}, M. Pokala^{*}, R. Saket and A. Raghuveer. *CIKM*, 2024.
- Measures of Closeness to Cordiality for Graphs** **[J.1]**
Anand Brahmabhatt[#], K. Rai[#] and A. Tripathi[#]. *Discrete Applied Mathematics Vol 370, Pages 157-166*, 2025.

Preprints

- Universal Learning of Nonlinear Dynamics** **[P.1]**
E. Dogariu, Anand Brahmabhatt and E. Hazan. *arXiv:2508.11990*, 2025.
- A New Approach to Controlling Linear Dynamical Systems** **[P.2]**
Anand Brahmabhatt[#], G. Buzaglo[#], S. Druchyna[#] and E. Hazan[#]. *arXiv:2504.03952*, 2025.
- Label Differential Privacy via Aggregation** **[P.3]**
Anand Brahmabhatt, R. Saket, S. Havaladar, A. Nasery and A. Raghuveer. *arXiv:2310.10092*, 2023.

Patents

- Cloud-Based Resource Allocation Using Meters** **[Pat.1]**
A. Sinha, S. Saini, S. Nair, S. Marathe, M. Gupta, Anand Brahmabhatt, A. Chauhan. *US Patent 20230259403*, 2023.

AWARDS AND HONORS

- Awarded the **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

RELEVANT COURSES

Machine Learning	Theoretical Machine Learning, Convex Optimization, Natural Language Processing, Machine Learning, Artificial Intelligence
Theoretical Computer Science	Advanced Algorithm Design, Complexity Theory, Discrete Mathematical Structures, Data Structures & Algorithms
Systems	Operating Systems, Computer Networks, Database Management Systems, Computer Architecture, Digital Logic & System Design
Mathematics	Real & Complex Analysis, Probability Theory, Linear Algebra, Differential Equations

SKILLS

- ML & Theory:** Dynamical Systems, LLMs, Spectral Methods, Online Learning, Differential Privacy
- Programming:** Python, JAX, PyTorch, TensorFlow, NumPy, SciPy, scikit-learn, C++