Nilesh Gupta

PhD Student
Department of Computer Science
University of Texas at Austin

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Google Scholar

Research Interests

End-to-end Web-scale Information Retrieval & Efficient LLMs

Education

University of Texas at Austin *2021 - present*
PhD student in Computer Science and Engineering
Advisor: Prof. Inderjit Dhillon

Indian Institute of Technology Bombay *2015 - 2019*
B.Tech (Honours) in Computer Science and Engineering
Advisor: Prof. Shivaram Kalyanakrishnan

Work Experience

Google Research *Fall 2024*
Student Researcher
Advisor: Dr. Felix Yu
Work on scalable in-context ranking with generative models

Google Deepmind *Summer 2024*
Student Researcher
Advisor: Dr. Prateek Jain
Work on token efficient large language models

Google *2022-2023, Summer 2025*
Student Researcher
Advisor: Prof. Inderjit Dhillon
Work on end-to-end search algorithms that scale to web-scale data

Microsoft Research India *2019 - 2021*
Research Fellow in Machine Learning and Optimization Group
Advisor: Dr. Manik Varma
Work on algorithms of Extreme Classification leading to multiple top-tier publications and impact across Microsoft products

Publications

Conference Publications

* - equal contribution

- **LLM-guided Hierarchical Retrieval**
  Nilesh Gupta, Wei-Cheng Chang, Ngot Bui, Cho-Jui Hsieh and Inderjit Dhillon
  Under review, 2025
- **Scalable In-context Ranking with Generative Models**
  Nilesh Gupta, Chong You, Srinadh Bhojanapalli, Sanjiv Kumar, Inderjit Dhillon and Felix Yu
  *Neural Information Processing Systems (**NeurIPS**), 2025*
- **Compressing Many-Shots in In-Context Learning**
  Devvrit Khatri, Pranamya Kulkarni, Nilesh Gupta, Yerram Varun, Liqian Peng, Jay Yagnik, Praneeth Netrapalli, Cho-Jui Hsieh, Alec Go, Inderjit S Dhillon, Aditya Kusupati and Prateek Jain
  Under review, 2025
- **EHI: End-to-end Learning of Hierarchical Index for Efficient Dense Retrieval**
  Ramnath Kumar*, Anshul Mittal*, Nilesh Gupta, Aditya Kusupati, Inderjit Dhillon and Prateek Jain
  *Transaction of Machine Learning (**TMLR**), 2024*
- **Exploring Design Choices for Building Language-Specific LLMs**
  Atula Tejaswi*, Nilesh Gupta* and Eunsol Choi
  *Empirical Methods in Natural Language Processing **EMNLP**, 2024*
- **Dual-encoders for Extreme Multi-label Classification**
  Nilesh Gupta, Devvrit Khatri, Srinadh Bhojanapalli, Ankit S. Rawat, Prateek Jain and Inderjit Dhillon
  *International Conference on Learning Representations (**ICLR**), 2024*

- **Negative Mining-aware Mini-batching for Extreme Classification**
  Kunal Dahiya*, Nilesh Gupta*, Deepak Saini*, Akshay Soni, Yajun Wang, Kushal Dave, Jian Jiao, Gururaj, Prasenjit Dey, Amit Singh, Deepesh Hada, Vidit Jain, Bhawna Paliwal, Anshul Mittal, Sonu Mehta, Ramachandran Ramjee, Sumeet Agarwal, Purushottam Kar and Manik Varma
  *International Conference on Web Search and Data Mining (**WSDM**), 2023*
- **ELIAS: End-to-end Learning to Index and Search in Large Output Spaces**
  Nilesh Gupta, Patrick Chen, Hsiang-Fu Yu, Cho-jui Hsieh and Inderjit Dhillon
  *Neural Information Processing Systems (**NeurIPS**), 2022*
- **Generalized Zero-Shot Extreme Multi-Label Learning**
  Nilesh Gupta, Sakina Bohra, Yashoteja Prabhu, Saurabh Purohit and Manik Varma
  *ACM SIGKDD Conference on Knowledge Discovery and Data Mining (**KDD**), 2021*
- **Extreme Regression for Dynamic Search Advertising**
  Yashoteja Prabhu, Aditya Kusupati, Nilesh Gupta and Manik Varma
  *International Conference on Web Search and Data Mining (**WSDM**), 2020* **(Long Oral)**
  *Workshop on eXtreme Classification: Theory and Applications @ **ICML**, 2020*

Selected Awards and Honors

- Ranked 4^{th} in ACM-ICPC Asia Regionals and 6^{th} in ACM-ICPC India Online
- All India Rank 384 in JEE Advanced (IIT-JEE) 2015 among 150,000 candidates
- Awarded the prestigious KVPY Fellowship from Government of India
- Ranked 2^{nd} in Regional Mathematics Olympiad (RMO) and among top 300 students in INMO

Teaching & Responsibilities

- *Graduate Teaching Assistantship* - Computer Science Department, UT Austin
  - Symbolic Programming - *Prof. Gordon S. Novak* — *Fall 2022*
  - Fundamentals of Machine Learning - *Prof. Inderjit Dhillon* — *Spring 2023, Spring 2025*
  - Principles of Machine Learning I - *Prof. Angela Beasley* — *Fall 2023, Spring 2024*
- *Undergraduate Teaching Assistantship* - Computer Science and Engineering, IIT Bombay
  - Computer Programming and Utilisation - *Prof. Ganesh Ramakrishnan* — *Autumn 2018*
  - Computer Programming and Utilisation - *Prof. Krishna S.* — *Autumn 2017*
  - Basic Calculus - *Prof. Amiya K. Pani* — *Autumn 2016*
- *MOOC Teaching Assistantship* - IITBombayX, edX
  - Data Structures and Algorithms - *Prof. Deepak B. Phatak* — *Spring & Autumn 2017*
- *Managing Extreme Classification Reading Group* - Microsoft Research India — *2020 - 2021*