Bhuvesh **Kumar**

Research Scientist · Ph.D. in Computer Science

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Education

Georgia Institute of Technology — *Atlanta, Georgia*

Ph.D. in Computer Science (Advisors: Dr. Jacob Abernethy and Dr. Jamie Morgenstern) — *2017 - 2022*

Georgia Institute of Technology — *Atlanta, Georgia*

M.S. in Computer Science (Specialization in Machine Learning, GPA: 4.0/4.0) — *2017 - 2022*

Indian Institute of Technology, Kanpur — *Kanpur, India*

B.Tech in Computer Science and Engineering (GPA: 9.7/10) — *2013 - 2017*

Work Experience

Snap Inc — *Bellevue, WA*

Research Scientist — *Sept 2024 - Present*

- I work on user modeling and personalization research with state-of-the-art machine learning paradigms such as generative AI, generative recommendation, and sequential recommendation
- I develop and implement my research on real-world recommendation systems at Snap driving direct product impact
- I am a co-creator and owner of the internal PyTorch platform that enables large scale distributed training and inference of recommendation models and LLMs, currently serving as the platform for all PyTorch recommendation models at Snap.

TikTok — *Bellevue, WA*

Machine Learning Scientist — *Jan 2023 - Sept 2024*

- Lead research and development projects in the core recommendation team, driving innovations in large-scale recommendation systems
- Introduced and owned re-rank which decides the final order of videos using sequence modeling, and drove over 1.5% gains in watch time
- Spearheaded a critical project, successfully transforming TikTok's recommendation system architecture in the US from a single data center to a disaster-tolerant, multi-data center design, ensuring scalability and reliability

Amazon — *Seattle, WA*

Applied Scientist Intern — *May 2021 - Aug 2021*

- Worked on fairness and transparency in machine learning with Prof. Michael Kearns and Dr. Matthäus Kleindessner
- Introduced a new notion for group fairness in multi arm bandits and designed a no-regret algorithm

University of Washington — *Seattle, WA*

Visiting Research Scientist — *Jan 2021 - April 2021*

- Worked on designing simple and incentive compatible auctions for revenue maximization in repeated auctions using differential privacy

Meta (Facebook) — *Menlo Park, CA*

Research Intern, Core Data Science — *May 2020 - Nov 2020*

- Developed algorithms for optimal spend plan prediction and automatic bid pacing for budget constraint ad campaigns

Meta (Facebook) — *Menlo Park, CA*

Machine Learning Engineering Intern — *May 2019 - Jul 2019*

- Optimized for Return on Ad Spend for ads ranking and products ranking in Dynamic Product Ads using deep learning
- Introduced a new deep learning architecture and increased ad revenue while saving 60 TB memory usage (86% decrease)

Georgia Institute of Technology — *Atlanta, GA*

Graduate Research Assistant — *Aug 2017 - Dec 2022*

- Researched on designing robust machine learning algorithms with provable guarantees in adversarial environments using tools from online learning, algorithmic game theory, and differential privacy

Awards

2025 **Best Paper Award**, Resource Papers, 34th ACM Conference on Information and Knowledge Management (CIKM)

2021 **NeurIPS Travel Award**, 34th Annual Conference on Neural Information Processing Systems

2017 **Chair's Fellowship**, The School of Computer Science, Georgia Institute of Technology

2014-16 **Academic Excellence Award (Dean's List)**, IIT Kanpur

2011 **KVPY Fellowship**, Government of India

2009 **NTSE Scholarship**, Government of India

Publications

Peer-Reviewed & Accepted Publications

- **[10] Sequential Data Augmentation for Generative Recommendation**
  19th ACM International Conference on Web Search and Data Mining **(WSDM 2026)**
  Geon Lee, Bhuvesh Kumar, Clark Mingxuan Ju, Tong Zhao, Kijung Shin, Neil Shah, and Liam Collins
- **[9] Learning Universal User Representations Leveraging Cross-Domain User Intent at Snapchat**
  48th International ACM SIGIR Conference on Research and Development in Information Retrieval **(SIGIR 2025)**
  Clark Mingxuan Ju, Leonardo Neves, Bhuvesh Kumar, Liam Collins, Tong Zhao, Yuwei Qiu, Qing Dou et al.
- **[8] Generative Recommendation with Semantic IDs: A Practitioner's Handbook**
  34th ACM International Conference on Information and Knowledge Management **(CIKM 2025)** **Best Paper Award in Resource Papers**
  Clark Mingxuan Ju, Liam Collins, Leonardo Neves, Bhuvesh Kumar, Louis Yufeng Wang, Tong Zhao, and Neil Shah
- **[7] Private Mechanism Design via Quantile Estimation**
  Thirteenth International Conference on Learning Representations **(ICLR 2025)**
  Yuanyuan Yang, Tao Xiao, Bhuvesh Kumar, and Jamie Morgenstern
- **[6] Revisiting self-attention for cross-domain sequential recommendation**
  31st ACM SIGKDD Conference on Knowledge Discovery and Data Mining **(KDD 2025)**
  Clark Mingxuan Ju, Leonardo Neves, Bhuvesh Kumar, Liam Collins, Tong Zhao, Yuwei Qiu, Qing Dou, Sohail Nizam, Sen Yang, and Neil Shah
- **[5] Accelerated Federated Optimization with Quantization**
  Data Engineering Bulletin 46, IEEE Computer Society **(IEEE Data Engineering Bulletin 2023)**
  Yeojoon Youn, Bhuvesh Kumar, and Jacob Abernethy
- **[4] ActiveHedge: Hedge meets Active Learning**
  The Thirty-Ninth International Conference on Machine Learning **(ICML 2022)** (Spotlight)
  Bhuvesh Kumar, Jacob Abernethy, and Venkatesh Saligrama
- **[3] Observation Free Attacks on Stochastic Bandits**
  Thirty-Fifth Annual Conference on Neural Information Processing Systems **(NeurIPS 2021)**
  Yinglun Xu, Bhuvesh Kumar, and Jacob Abernethy
- **[2] Bridging Truthfulness and Corruption-robustness in Multi-Armed Bandit Mechanisms**
  Incentives in Machine Learning Workshop at ICML 2020
  Yinglun Xu, Bhuvesh Kumar, Jacob Abernethy, Thodoris Lykouris
- **[1] Learning Auctions with Robust Incentive Guarantees**
  Thirty-Third Annual Conference on Neural Information Processing Systems **(NeurIPS 2019)**
  Bhuvesh Kumar, Jacob Abernethy, Rachel Cummings, Jamie Morgenstern, Samuel Taggart

Preprints

- **[1] Optimal spend rate estimation and pacing for ad campaigns with budgets**
  arXiv preprint arXiv:2202.05881 **(2022)**
  Bhuvesh Kumar, Jamie Morgenstern, and Okke Schrijvers

Software Packages

- **[1] GRID: Generative Recommendation with Semantic IDs**
  2025 Release **380+ stars on GitHub**
  Developers: Clark Mingxuan Ju, Liam Collins, Bhuvesh Kumar, and Leonardo Neves

Academic & Professional Service

Reviewer/Program Committee Member

- International Conference on Learning Representations (ICLR), 2026
- Conference on Neural Information Processing Systems (NeurIPS), 2025
- International Conference on Learning Representations (ICLR), 2025
- International Conference on Learning Representations (ICLR), 2024
- Conference on Learning Theory (COLT), 2023
- International Conference on Machine Learning (ICML), 2022
- Journal of Machine Learning Research (JMLR), 2021
- Annual Symposium on Discrete Algorithms (SODA), 2021
- International Conference on Algorithmic Learning Theory (ALT), 2021
- Conference on Learning Theory (COLT), 2021
- Conference on Neural Information Processing Systems (NeurIPS), 2021
- Conference on Learning Theory (COLT), 2020

- Conference on Neural Information Processing Systems (NeurIPS), 2020

Seminar Organizer

- Algorithms, Combinatorics, & Optimization Student Seminar, Georgia Institute of Technology , 2020-2022

Competition Judge

- Judge DubHacks, University of Washington's Hackathon, 2025
- Robotics Judge at Regeneron International Science and Engineering Fair (ISEF), 2022

Professional Memberships

- Member, Association for Computing Machinery (ACM)
- Member, Institute of Electrical and Electronics Engineers (IEEE)

Teaching

Course Instructor

Online Decision Making in Machine Learning (ECE 8803) – Georgia Tech *Fall 2022*

Teaching Assistant

Machine Learning for Trading (CS 7646) – Georgia Tech *Spring 2022, Summer 2022*

Machine Learning Theory (CS 7545) – Georgia Tech *Fall 2018, Fall 2019*

Introduction to Computing (ESC 101) – IIT Kanpur *Fall 2016, Spring 2017*

Leadership & Community

Student Leadership

- Founding Vice President of the School of Computer Science Graduate Student Association, Georgia Tech (2021-2022)
- Student Nominee in Faculty Hiring Committee at School of Computer Science, Georgia Tech (2021-2022)
- Coordinator of the Programming Club, IIT Kanpur (2015-2016)
- Leader of Science Coffeehouse, IIT Kanpur (2016-2016)

Community Service

- Organizer of ML at GT Social Hour, Georgia Tech (2021)
- Organizer of the College of Computing Happy Hour, Georgia Tech (2018-2019)
- Co-organizer of the PhD visit weekend, School of Computer Science, Georgia Tech (2020)
- Mentor at HackGT Hackathon, Georgia Tech (2018, 2019)