Pritish Chakraborty

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Education

- **Indian Institute of Technology, Bombay** — Mumbai, Maharashtra
  MS + PhD (dual degree) in Computer Science; GPA: 9.14/10 — *July 2021 – June 2024 — July 2024 - present*
- **Manav Rachna International University** — Delhi NCR
  BTech in Computer Science and Engineering; GPA: 8.27/10 — *July 2010 – May 2014*

Research Interests

Machine Learning on Graphs, Geometric Deep Learning, Neural Tools for Combinatorial Algorithms on Graphs, Generative Models, Applications (AI4Science), Core ML

Research Work

- **Adversarial Attacks against Neural Temporal Point Processes**
  Advisors: Prof. Abir De and Prof. Srikanta Bedathur — *Nov 2023 - June 2024*
  Developed new class of **fully differentiable** adversarial attacks for marked temporal point process (MTPP) models, while outlining why standard attacks (PGD, etc) are not suitable. The attack corrupts input continuous-time event sequence data in a way that perturbs order relationship between elements of a sequence. Subsequently, developed algorithm to train MTPP models to become robust to this class of attacks. Evaluated the method on four real-world datasets, in addition to datasets from specific domains. Results show that our method out-performs standard attacks. **Paper accepted to AAAI 2025**.
- **Learning and Maximizing Influence in Social Networks Under Capacity Constraints**
  Advisors: Prof. Abir De, Prof. Sayan Ranu — *Jan 2022 - Aug 2022.*
  Developed and implemented an MC simulation based method to obtain an (approximately) optimal solution to the **top-K influence maximization problem**. Helped develop **alpha-submodular** theoretical guarantees in the process. Developed corresponding machine learning model to predict the top-K maximized influential nodes in a graph. Both simulator and ML models outperformed state-of-the-art influence maximization methods. **Paper accepted to WSDM 2023**. (Please see: https://tinyurl.com/topk-im)
- **Learning Resource-Efficient Mixture Models via Subset Selection**
  Advisors: Prof. Abir De, Prof. Rishabh Iyer, Prof. Ganesh Ramakrishnan — *Dec 2022 - Jan 2023.*
  Responsible for the entire experiment pipeline where we had to run a thorough evaluation of the proposed mixture models framework. Reported results on comparison of various partitioning baselines against our proposed method, as well as the training vs inference time GPU memory consumption of our method against certain knowledge-distillation baselines. **Paper accepted to ICML 2023**. (Please see: https://tinyurl.com/mix-cluster)
- **Projects in Graph ML + Systems**
  Advisors: Prof. Abir De + Others.
  I am currently involved in projects on topics such as **graph compression** and **graph retrieval**. These, and more, will be fine-tuned within an overall story as I converge on a thesis.

Teaching

- **CS419M : Introduction to Machine Learning** *(Jan 2022 - Apr 2022)*
- **CS293 : Data Structures and Algorithms Lab** *(July 2022 - Nov 2022)*
- **CS769 : Optimization in Machine Learning** *(Jan 2023 - Apr 2023)*
- **CS768 : Learning with Graphs** *(Jul 2023 - Nov 2023)*
- **CS635 : Information Retrieval on Graphs and Text** *(Jul 2024 - Nov 2024)*

Technical Skills

- **Languages**: Python, Javascript, C/C++, SQL, other languages such as C# and Java
- **Technologies**: Pytorch, Pytorch Geometric, Django, Angular.js, React, REST, other web technologies

Work Experience

- **Google Research India** Hybrid
  Student Researcher *July 2023 - November 2023*
  - **Responsibilities** End-to-end research and execution. Building Google-specific tools based on my work on influence maximization.
  - **Projects** Research on the robust influence maximization problem. Development of general foundation models for information diffusion. Development of fast neural approximators for replacement of MC simulations.
- **Instahyre** New Delhi, India
  Software Engineering/Head of Engineering *July 2015 - May 2019*
  - **Responsibilities** Handled the complete tech stack and deployment pipeline for multiple feature release cycles. Mentored and brought junior engineers upto speed.
  - **Research and Execution** Undertook systems research for various aspects of the codebase, both during maintenance and when extending features from scratch. Aligned this research with business agenda - for example, deciding to scale parts of the system, vertically or horizontally, depending on projected user count and user load across time. Additionally, undertook user experience research when deciding to release certain big-ticket features, for example performing large scale A/B tests.
  - **Projects** Worked on several important features - the matching engine, the Elasticsearch-powered search platform, internal tools - end to end. Took responsibility for a streamlined UX and production management.

Courses Taken

Foundations of Machine Learning, Algorithms and Complexity, Retrieval on Text and Graphs, Advanced Machine Learning, Optimization in Machine Learning, Organization of Web Information (NLP+IR), Real Analysis, Basic Algebra