Parikshit Bansal

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Education

The University of Texas at Austin *Austin, Texas*
Ph.D. in Computer Science *2023 - Current*
Advisor: Prof. Sujay Sanghavi

Indian Institute of Technology, Bombay *Mumbai, India*
B.Tech. (Hons.) in Computer Science and Engineering *2017 - 2021*
B.Tech. Project: Deep Learning Methods for Missing Value Imputation in Time Series
Advisor: Prof. Sunita Sarawagi
CPI : 9.4/10.0

Recent Pre-Prints

Enabling Approximate Joint Sampling in Diffusion LMs
Parikshit Bansal, Sujay Sanghavi
Under Submission

Context-Free Synthetic Data Mitigates Forgetting
Parikshit Bansal, Sujay Sanghavi
Under Submission

Publications

Understanding Self-Supervised Learning via Gaussian Mixture Models
Parikshit Bansal, Ali Kavis, Sujay Sanghavi
The Thirty-Ninth Annual Conference on Neural Information Processing Systems NeurIPS 2025

Understanding the Training Speedup from Sampling with Approximate Losses
Rudrajit Das, Xi Chen, Bertram Ieong, Parikshit Bansal, Sujay Sanghavi
Proceedings of the 41st International Conference on Machine Learning, PMLR 235:10127-10147, 2024 ICML 2024

Controlling Learned Effects to Reduce Spurious Correlations in Text Classifiers
Parikshit Bansal, Amit Sharma
Proceedings of the 61st Annual Meeting of the Association for Computational Linguistics (Volume 1: Long Papers) ACL 2023

Missing Value Imputation on Multidimensional Time Series
Parikshit Bansal, Prathamesh Deshpande, Sunita Sarawagi
Proceedings of the VLDB Endowment, Volume 14, 2020-2021 VLDB 2021

Other Pre-Prints and Workshop Papers

Large Language Models as Annotators: Enhancing Generalization of NLP Models at Minimal Cost
Parikshit Bansal, Amit Sharma
Preprint

Improving Out-of-Distribution Generalization of Text-Matching Recommendation Systems
Parikshit Bansal, Yashoteja Prabhu, Emre Kiciman, Amit Sharma
NeurIPS 2022 Workshop on Causality for Real-world Impact NeurIPS 2022

Work Experience

Amazon Web Services *Santa Clara*
Applied Scientist Intern | Manager : Ashish Khetan *Summer 2024*
Worked on reducing the inference latency of Large Language Models, specifically via Speculative Decoding.
Designed alternate loss functions and tested different architectural changes for developing an accurate and efficient ”speculator”.

Microsoft Research *Bangalore, India*

Research Fellow | Advisor : Dr. Amit Sharma *2021 - 2023*

Worked on problems around OOD generalisation of NLP systems with application in recommendation systems.
Also explored challenges in using Large Language Models as annotators for unlabeled data.

Agent Machine Learning Lab, Rutgers Univ *Remote Internship*

Research Intern | Advisor : Prof. Sungjin Ahn *Summer 2021*

Worked on various problems around self-supervised representations, object centric, and model-based reinforcement learning.

D.E. Shaw & Co. *Hyderabad, India*

Data Science Intern *Summer 2020*

Programmed Auto-Cohort Recommender for bining defaulted loan based on optimal clustering on attributes

Machine Learning and Genomics Lab, UCLA *Los Angeles, USA*

Visiting Researcher | Advisor : Prof. Sriram Sankararaman *Summer 2019*

Explored Sketching algorithms for scaling complex trait genetics algorithms to large scale genetic datasets

Selected Research Projects

Large Language Models as Data Annotators *Microsoft Research India*

Dr. Amit Sharma *Dec 2022 - Aug 2023*

- Tackled the problem of annotating unlabeled data by leveraging Large Language Models (LLMs) as annotators. This LLM annotated data is augmented with the original ground truth labeled data to train a downstream task specific model.
- Showed that naively (uniform sampling/uncertainty sampling) selecting unlabeled inputs for annotation with LLMs is harmful to accuracy
- Constructed a heuristic measure to instead sample the most informative data samples for downstream task specific classifier.
- Led to improvements in both natural language and recommendation systems benchmarks.

Out-of-distribution Generalization for Text-Matching Recommender Systems *Microsoft Research India*

Dr. Amit Sharma, Dr. Emre Kiciman, Dr. Yashoteja Prabhu *Aug 2021 - Dec 2022*

- Showed that finetuned text-matching recommenders are worse than pretrained model they are finetuned on for out-of-distribution data
- Attributed the drop in out-of-distribution performance to model weighing certain spurious tokens disproportionately
- Modeled a causal graph and formed a mathematical framework to justify the observations
- Proposed a novel regularisation technique leveraging the *base* model for constructing augmented samples to regularise weighing of tokens

Missing Value Imputation on Multidimensional Time Series *IIT Bombay*

Prof. Sunita Sarawagi *Aug 2020 - July 2021*

- Introduced novel convolution based transformer model for capturing long range patterns yielding a speedup of 10x
- Worked on efficient batching for samples for shared forward pass for multiple samples in a batch
- Formulated kernel regression module for aggregating signals from correlated time series.
- Got upto 60% reduction in MAE error with similar running time to Matrix completion technique s(e.g. SVD). Published in VLDB, 2021

Achievements

2021 **Undergraduate Research Award (URA02)**, as recognition of truly exceptional work done in B.Tech. Project
2020 **Undergraduate Research Award (URA01)**, as recognition of research/ developmental effort
2020 **Institute Academic Prize**, for academic excellence (top 3 students) during the term of 2019-20
2017 **All India Rank 62**, JEE Advanced, (among 1.5 million candidates in India)
2016 **NSEP,NSEC**, Ranked among top 1% nationwide in Physics and Chemistry Olympiads resp.
2015 **KVPY Fellowship**, Shortlisted for the fellowship, conducted by the Govt. of India for two consecutive years

Courses

Probability Stochastic Processes, Online Learning, Advanced Probability
Optimization/Linear Algebra Convex Optimization, Large Scale Optimization, Continuous Algorithms, Numerical Linear Algebra
Computer Science Generative Models, Grad. Algorithms

Reviewer Services

Natural Language Processing EMNLP 2023
Machine Learning NeurIPS 2024, ICLR 2025, AISTATS 2025