Anush Kini

Email: anushkini@gmail.com
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Education

PES University — Bengaluru
B.Tech in Computer Science and Engineering — *2017 – 2021*
CGPA : 9.5 / 10.0, Graduated First class with Honors

Research Experience

University College London (UCL) — September 2024 - Present
Research Collaborator | Advisors: Dr. Ilija Bogunovic — *London, UK (Remote)*

- Developing reliable AI alignment techniques to enhance group fairness under noisy preference labels
- Applying ideas from distributionally robust optimization to improve performance across groups

Microsoft Research — July 2022 - July 2024
Research Fellow | Advisors: Dr. Nagarajan Natarajan, Dr. Sayak Ray Chowdhury — *Bengaluru, India*

- Worked on multiple research projects in machine learning, focusing on optimization algorithms, information retrieval, and AI alignment, resulting in publications at top-tier conferences (ICML, NSDI)
- Collaborated with product teams to integrate research findings into practical applications, resulting in a patent filing and the release of an open-source Python library for configuration parameter tuning

Indian Institute of Science — May 2020 – Dec 2020
Research Intern | Advisors: Prof. Uma Ranjan, Prof. Monica Anand — *Bengaluru, India*

- Analyzed indcidence and mortality trends of COVID-19 in India [OPH Journal 2023]

Publications

** indicates equal contribution*

"**Provably Robust DPO: Aligning Language Models with Noisy Feedback**" *ICML 2024*.
Anush Kini*, Sayak Ray Chowdhury*, Nagarajan Natarajan.

"**OPPerTune: Post-Deployment Configuration Tuning of Services Made Easy**" *NSDI 2024*.
Gagan Somashekar*, Karan Tandon*, **Anush Kini**, ..., Anshul Gandhi, Nagarajan Natarajan.

"**GAR-meets-RAG Paradigm for Zero-Shot Information Retrieval**" *arXiv 2023*.
Anush Kini*, Daman Arora*, Sayak Ray Chowdhury, Nagarajan Natarajan, Gaurav Sinha, Amit Sharma.

"**Sex-disaggregated Analysis of Risk Factors of COVID-19 Mortality Rates in India**" *OPH Journal 2023*.
Anush Kini, Harish PB, Monica Anand, Uma Ranjan.

Selected Research Projects

Provably Robust DPO | Paper
Advisors: Dr. Nagarajan Natarajan, Dr. Sayak Ray Chowdhury

- Proposed robust variants of preference-based alignment algorithms that mitigate the effect of noisy preferences
- Provided the first theoretical performance bounds for DPO and validated results empirically on real-world datasets

UniPrompt
Advisors: Dr. Amit Sharma

- Contributed to the development of UniPrompt, a textual gradient algorithm for optimizing prompts for LLMs
- Focused on code cleanup, optimization, and implementation of key heuristics for production environments

OPPerTune | Code , Paper
Advisors: Dr. Nagarajan Natarajan

- Developed an optimization framework to fine-tune configuration parameters of applications in deployment
- These methods improved mean workload times by >50% with 67% fewer samples compared to existing SOTA methods

GAR-meets-RAG Paradigm for Zero-Shot Information Retrieval | Paper

Advisors: Dr. Nagarajan Natarajan

- Proposed an approach merging Generation Augmented Retrieval(GAR) and Retrieval Augmented Generation(RAG) paradigms to improve key metrics in zero-shot information retrieval.
- This approach involved using an LLM as a meta-controller where it leverages query rewrites and pseudo-relevance feedback to iteratively improve retrieval

Sex-disaggregated Analysis of Risk Factors of COVID-19 Mortality Rates in India | Paper

Advisors: Prof. Uma Ranjan, Prof. Monica Anand

- Conducted sex-disaggregated analysis of COVID-19 mortality risk factors in India by applying statistical methods
- Ran statistical tests and analyzed lasso regression curves to study the gender differentials across various demographic parameters

Industry Experience

Google (through Optimum InfoSystems) Aug 2021 - June 2022

Data Commons Associate *Bengaluru, India*

- Made public datasets accessible through the Data Commons project
- Developed and optimized pipelines to ingest and structure public data into a knowledge graph Merged PRs

Intel Corporation Jan 2021 – May 2021

Machine Learning Software Intern *Bengaluru, India*

- Designed and implemented a comprehensive pipeline to track and analyze performance of ML workloads across various hardware configurations
- Developed a MongoDB database schema optimized for efficient storage and retrieval of performance metrics and scores
- Created an interactive web application using Flask and D3.js to visualize and interpret performance data

Academic Contributions and Leadership

Parallel Systems Research Lab, PES University | Mentor

- Guided a team of junior undergraduate students in developing a plagiarism detector, focusing on identifying sophisticated code obfuscation techniques Project Poster
- Conducted workshops on advanced programming tools and techniques

Topics In Deep Learning | Teaching Assistant

- Developed teaching materials and assignments for an undergraduate course on advanced Deep Learning concepts
- Graded and provided detailed feedback on assignments

Centre for Data Science and Machine Learning, PES University | Research Assistant

- Created an underwater image dataset and trained Generative Adversarial Networks (GANs) to generate underwater images Report

Mlpack | Open Source Contributor

- Contributed to Mlpack, a C++ machine learning library, by implementing new algorithms and optimizing existing ones Merged PRs

Awards

Microsoft Global Hackathon 2022: Won third place in two categories - Hack 2 enable and Hack for Society
Google AI Summer School 2020: Among the 150 students selected throughout India for a summer school on AI organized by Google. Participated in lectures and discussions with eminent AI researchers Website Link
Intel Student Project: Secured 1st place in a project by Intel on image segmentation Certification |Blog Link
Prof. CNR Rao Merit Scholarship: Awarded annual merit scholarships for outstanding academic performance throughout undergraduate studies Certification

Skills

Languages – *Advanced*: Python, C++; *Intermediate*: Bash, SQL, Javascript, HTML; *Familiar*: R
ML Frameworks – Pytorch, Tensorflow
Development – MongoDB, Flask, D3.js