Anush Kini

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Website: abilityguy.github.io

Education

PES University — Bengaluru
B.Tech in Computer Science Engineering; CGPA : 9.5 / 10.0 — *2017 – 2021*

Publications

[1] Daman Arora*, Anush Kini*, Sayak Ray Chowdhury, Nagarajan Natarajan, Gaurav Sinha, and Amit Sharma. **GAR-meets-RAG Paradigm for Zero-Shot Information Retrieval**. *Under review*, 2023 Paper

[2] Gagan Somashekar, Karan Tandon, Anush Kini, Chieh-Chun Chang, Petr Husak, Ranjita Bhagwan, Mayukh Das, Anshul Gandhi, and Nagarajan Natarajan. **OPPerTune: Post-Deployment Configuration Tuning of Services Made Easy**. In *Networked Systems Design and Implementation (NSDI)*, 2024 Paper

[3] Anush Kini, Harish PB, Monica Anand, and Uma Ranjan. **Sex-disaggregated Analysis of Risk Factors of COVID-19 Mortality Rates in India**. *The Open Public Health Journal*, 2023 Paper

Research Experience

Microsoft Research — July 2022 - Present
Research Fellow | Advised by: Dr. Nagarajan Natarajan, Dr. Gaurav Sinha — *Bengaluru, India*

- Developed SelfTune, a reinforcement learning framework to automatically tune configuration parameters of live applications in deployment
- Devised *Hybrid Bandits*, a black-box optimization algorithm that jointly tunes hybrid spaces i.e., numerical and categorical parameters
- Developed a novel strategy using decision trees to design scoping policies for the tuning of configuration parameters
- Devised a novel feedback pipeline using Large Language Models and lexical retrievers to enhance zero-shot information retrieval
- Currently working on developing a Bayesian optimization algorithm to optimize time-varying black-boxes in hybrid spaces
- **Keywords:** *Black-box Optimization, Reinforcement Learning, Information Retrieval*

Indian Institute of Science — May 2020 – May 2021
Research Intern | Advised by: Dr. Uma Ranjan — *Bengaluru, India*

- Aggregated incidence and mortality data from public sources on COVID-19 in India
- Developed visualizations and ran statistical tests to analyse the gender differentials across different demographic parameters.
- Analyzed lasso regression curves to determine correlates with mortality across three cohorts levels
- **Keywords:** *Statistical Modeling, Hypothesis Testing*

Industry Experience

Google — Aug 2021 - June 2022
Data Commons Associate — *Bengaluru, India*

- Made public datasets more accessible through the open source Data Commons project
- Developed pipelines and tools in Python to ingest US and Indian Public data into the Data Commons knowledge graph Merged PRs

Intel — Jan 2021 – May 2021
Machine Learning Software Intern — *Bengaluru, India*

- Designed a pipeline to track the performance of workloads on different hardware configurations
- Modelled and developed a MongoDB database to store performance metrics and scores
- Developed a web application using Flask and D3.js that interacts with the database and displays relevant visualisations and processed data

The Hi-Tech Robotic Systemz Ltd June 2019 – August 2019
Machine Learning Intern *Gurugram, India*

- One of 10 interns chosen for a collaborative internship with Carnegie Mellon University's (CMU) Robotics Institute
- Participated in webinars headed by experts from CMU, in the field of machine learning and robotics
- Developed and benchmarked classifiers to identify day and night images from the live feed of a self-driving vehicle
- Ported the Aggregate Channel Features algorithm(Piotr Dollar et al.) in Python and deployed it as a real-time pedestrian detector

Other Experiences and Roles

Mlpack | *Open Source Contributor*
- Mlpack is a C++ machine learning library Merged PRs

Parallel Systems Research Lab, PES University | *Member*
- Developed a compiler to eliminate dead code. Deployed this compiler along with a plagiarism detector to detect code obfuscation in assignment submissions Poster
- Delivered a talk on Vim and Shell Scripting Slides

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

Topics In Deep Learning | *Teaching Assistant*
- Contributed to the development of teaching materials and assignments for an undergraduate course on different subjects in Deep Learning

Selected Projects

- **INK Talks Search Engine:** Used GloVe vector embeddings to create a cosine-similarity based search engine for the videos on the INKTalks.com website. Code
- **Deep Autoencoders for Compression:** Applied autoencoders to compress the 4 momentum features of jet particles from ATLAS experimental data to 3 features Code
- **Low Birth Weight Detection:** Used machine learning techniques to accurately identify low birth weight cases Report
- **Multi-Dimensional Knapsack using Genetic Algorithms:** Employed Genetic Algorithms to generate approximate solutions for various instances of the multi-dimensional knapsack problem Report

Awards

- **Google AI Summer School 2020:** Among the 150 applicants selected throughout India. 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 Blog Link
- **Prof. CNR Rao Scholarship:** Awarded merit scholarships for outstanding academic performance during my undergraduate studies

Skills

Languages: C, C++, Python, Shell, R
Frameworks: Pytorch, Tensorflow
Technologies: Git, LaTeX, Amazon AWS, Heroku, MongoDB, Flask, D3.js

Relevant Courses

Undergraduate: Machine Learning, Natural Language Processing, Digital Image Processing, Linear Algebra, Data Analytics, Cloud Computing, Compiler Design, Web Technologies, Computer Networks, Operating Systems, Database Systems, Computer Architecture, Data Structures, Advanced Algorithms
Online: Machine Learning by Andrew Ng, DeepLearning.AI TensorFlow Developer - 4 course specialization. , Deep Learning - 5 course specialization.