Anush Kini

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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, Ranked in the top 5% of class

Publications and Preprints

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

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

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

Research Experience

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

- **OPPerTune**
  - Worked with Dr. Nagarajan Natarajan on developing an open source optimization framework, using reinforcement learning algorithms to fine-tune configuration parameters of applications in deployment
  - These methods improved mean workload times by more than 50%, utilizing only 33% of the number of samples compared to existing methods
  - **Keywords:** *Black-box Optimization, Reinforcement Learning*
- **GAR-meets-RAG for Information Retrieval**
  - Worked with Dr. Nagarajan Natarajan and Dr. Gaurav Sinha on a novel feedback pipeline leveraging Large Language Models and Lexical Retrievers, achieving state-of-the-art performance in zero-shot information retrieval benchmarks
  - **Keywords:** *Large Language Models, Information Retrieval*

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

- Aggregated and examined incidence and mortality data on COVID-19 in India
- Developed visualizations and ran statistical tests to study the gender differentials across various demographic parameters
- Analyzed lasso regression curves to identify 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 public data into a 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 a MongoDB database to store performance metrics and scores
- Developed a web application using Flask and D3.js that 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

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

Parallel Systems Research Lab, PES University | *Member and Mentor*

- Developed a compiler to eliminate dead code. Mentored junior undergraduate students to develop a plagiarism detector with a focus on detecting code obfuscation. Poster
- Delivered a talk on Vim and Shell Scripting Slides

Topics In Deep Learning | *Teaching Assistant*

- Contributed to the development of teaching materials and assignments for an undergraduate course on subjects in Deep Learning

Mlpack | *Open Source Contributor*

- Mlpack is a C++ machine learning library Merged PRs

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

- **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 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.