

Sai Anuroop Kesanapalli

J N Tata Scholar | USC Viterbi | IISc | IIT Dharwad

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EDUCATION

M.S., University of Southern California

August 2022 - May 2024 (Exp.)

Major: Computer Science

CGPA: 3.83/4

B. Tech., Indian Institute of Technology Dharwad

July 2017 - June 2021

Major: Computer Science and Engineering

CPI: 8.86/10

SKILLS

Languages Python, C++, C, Bash, HTML

Libraries PyTorch, NumPy, pandas, scikit-learn, NLTK, Matplotlib, CSS

Tools Git, L^AT_EX, MATLAB, GDB

OS Linux, Linux4Tegra, macOS, Weenix OS

WORK EXPERIENCE

MACHINE LEARNING SOFTWARE INTERN (Full-time)

DeGirum Corp., Santa Clara

Summer Internship

May 2023 - August 2023

Developed an ONNX OCR pipeline with pre and post-processor modules compatible with edge-hardware [OCR Deep Dive]. Worked on a NumPy-only implementation of the forward pass of some vision-based PyTorch operators such as Conv2D, MaxPool, among others, and published as a PyPI package [beaverpy].

PROJECT ASSOCIATE - I (RESEARCH ENGINEER) (Full-time)

Indian Institute of Science, Bangalore

Advisor: Prof. Yogesh Simmhan

August 2021 - July 2022

Worked on performance characterization of Nvidia Jetson edge-accelerators on deep learning workloads [1, 3, 4], a review of systems research into training deep learning models on the edge hardware [2], and also on a Federated Learning project involving dataset condensation as a subroutine.

RESEARCH EXPERIENCE

COURSE PRODUCER (Part-time)

University of Southern California, Los Angeles

Advisor: Prof. Vatsal Sharan

August 2023 - Present

CP for CSCI 699: Theory of Machine Learning, a doctoral-level course, offered in Fall 2023, and CSCI 567: Machine Learning, offered in Spring 2024. I assist in grading homeworks, and help with scribing lectures into L^AT_EX.

RESEARCH ASSISTANT (Part-time)

University of Southern California, Los Angeles

Advisor: Prof. Vatsal Sharan

March 2023 - August 2023

Contributed to an open source project [Tensor Toolbox] on tensor decomposition methods, and worked on a faster C++ implementation of a random forest based anomaly-detection algorithm [PIDForest].

UNDERGRADUATE RESEARCHER (B. Tech. Project)

Indian Institute of Technology Dharwad

Advisor: Prof. B. N. Bharath

August 2020 - June 2021

Worked on Federated Algorithms with Bayesian [5] and Exponential Weighted Average [Report | Code] approaches.

AWARDS & ACHIEVEMENTS

2024 **Gift Award and Travel Grant** by **Tata Education and Development Trust** for studies abroad.

2023 **J N Tata Endowment Scholarship** for the higher education of Indians, for the year 2023-24.

2023 **NSF Travel Grant** for attending SIGMETRICS, co-located with ACM FCRC 2023, Orlando, FL.

2020 **AP grade** for exceptional performance twice: CS 405 B. Tech. Project - CSE on Federated Learning in Autumn 2020-21, and CH 301 Environmental Studies in Spring 2019-20, during B. Tech. at IIT Dharwad.

2017 IIT JEE (Advanced) **All India Rank 8682** among ~171,000 candidates.

2016 **Telangana State Rank 1** among ~700,000 candidates in first year and under top ten ranks in second year TSBIE Intermediate Public Examination.

2014 **Certificate of Merit** from CBSE Delhi, for outstanding performance and for obtaining Grade **A1** in all the five subjects in Secondary School Examination.

2014 Recipient of Meritorious Student, School Topper and Star of Stars awards, St. Michael's School, Secunderabad.

PUBLICATIONS

1. Prashanthi S.K, **Sai Anuroop Kesanapalli**, and Yogesh Simmhan. “Characterizing the Performance of Accelerated Jetson Edge Devices for Training Deep Learning Models”. In: SIGMETRICS '23. Orlando, Florida, United States: Association for Computing Machinery, 2023, pp. 37–38. doi: [10.1145/3578338.3593530](https://doi.org/10.1145/3578338.3593530).
2. Prashanthi S. K, Aakash Khochare, **Sai Anuroop Kesanapalli**, Rahul Bhope, and Yogesh Simmhan. “Don’t Miss the Train: A Case for Systems Research into Training on the Edge”. In: *2022 IEEE International Parallel and Distributed Processing Symposium Workshops (IPDPSW)*. 2022, pp. 985–986. doi: [10.1109/IPDPSW55747.2022.00157](https://doi.org/10.1109/IPDPSW55747.2022.00157).
3. Prashanthi S.K, **Sai Anuroop Kesanapalli**, and Yogesh Simmhan. “Characterizing the Performance of Accelerated Jetson Edge Devices for Training Deep Learning Models”. In: *Proc. ACM Meas. Anal. Comput. Syst.* 6.3 (2022). doi: [10.1145/3570604](https://doi.org/10.1145/3570604).
4. Prashanthi S. K, **Sai Anuroop Kesanapalli**, Aakash Khochare, and Yogesh Simmhan. “Characterizing the Performance of Deep Learning Workloads on Accelerated Edge Computing Devices”. In: *28th IEEE International Conference on High Performance Computing, Data & Analytics Student Research Symposium (HiPC SRS)*. 2021, [Poster].
5. **Sai Anuroop Kesanapalli** and B. N. Bharath. “Federated Algorithm with Bayesian Approach: Omni-Fedge”. In: *ICASSP 2021 - 2021 IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP)*. 2021, pp. 3075–3079. doi: [10.1109/ICASSP39728.2021.9413571](https://doi.org/10.1109/ICASSP39728.2021.9413571).

PROJECTS

A multimodal architecture with shared encoder that uses spectrograms for audio ¹	[Slides] Report Code
Leveraging static analysis for evaluating code-generation models	[Slides] Report Code
Implemented Procs, VFS, and VM kernel modules of Weenix OS	[CS 402, USC]
beaverpy: An implementation of PyTorch operators using only NumPy	[Code]
Forward-Forward: Is it time to bid adieu to BackProp?	[Slides] Code
Presentation on the Implicit Bias of SGD	[Slides]
Notes on Rethinking Classic Learning Theory in Deep Neural Networks	[Notes]
Store Sales - Time Series Forecasting	[Report] Code
Heterogeneity-Aware Hashing	[Slides] Report Code
Credit Card Fraud Detection	[Poster] Report Code
Implementation of Immediate Files in Minix OS	[Report] Code
Buffer Manager for PF Layer of ToyDB	[Report] Code
Processor Simulator for ToyRISC	[Code]
TCP Congestion Control	[Report] Code

COURSEWORK

Graduate:	Computational Perspectives on the Frontiers of Machine Learning, Machine Learning, Deep Learning and its Applications, Applied Natural Language Processing, Multimodal Probabilistic Learning of Human Communication, Operating Systems, Analysis of Algorithms
Undergraduate:	Mathematics for Data Science, Artificial Intelligence, Pattern Recognition & Machine Learning, Software Engineering, Distributed Systems, Databases & Information Systems, Compilers, Computer Networks, Computer Architecture, Digital Systems, Design & Analysis of Algorithms, Data Structures & Algorithms, Elementary Algebra & Number Theory, Graph Theory & Combinatorics, Numerical Analysis, Linear Algebra, Ordinary Differential Equations, Calculus, Electricity & Magnetism, Quantum Physics, Economics

INTERESTS

MLOps, Edge-GPU Performance Characterization, Systems for ML, Statistical Machine Learning, Deep Learning Theory, Natural Language Processing, Federated Learning, and Operating Systems.

¹Work in progress