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, LaTeX, 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 *(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

Course Producer 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 LaTeX.

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] [Code | Slides] and Exponential Weighted Average [Report | Code] approaches.

AWARDS & ACHIEVEMENTS

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

2023 Awarded **Travel Grant** by **Tata Education and Development Trust** for studies abroad.

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

2017 IIT JEE (Advanced) **All India Rank 8682** among ~160,000 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 Received **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.
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.
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.
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.

Projects

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, 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.