Akaash R. Parthasarathy

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Education

Georgia Institute of Technology Expected Graduation: May 2026
Master of Science in Computer Science, Specialization in Machine Learning

Georgia Institute of Technology Expected Graduation: May 2025
Bachelor of Science in Computer Science **GPA: 4.0/4.0**

- Undergraduate Teaching Assistant – Design and Analysis of Algorithms (CS 3510)
- President's Undergraduate Research Award (declined)

Experience

Undergraduate Researcher May 2023 – Present
Fung Lab, Georgia Tech School of Computational Science & Engineering

- Developing generalizable and large-scale foundation models for materials applications using MatDeepLearn package
- Devised novel derivative-based pre-training method to enhance graph neural network (GNN) performance on materials property inference tasks and improved over baseline by up to 25.1%; published in RSC Digital Discovery Journal
- Implemented sequential model-based optimization and improved model performance on materials datasets by 93%
- Building distributed GNN training framework on Frontier supercomputer using PyTorch FSDP and DeepSpeed ZeRO

Software Development Engineering Intern May 2024 – Aug 2024
Amazon

- Delivered integrated, end-to-end experiences for 1M+ employees to discover, enroll in, and manage Amazon benefits
- Designed secure micro-frontend for inspecting and refreshing employee data caches using TypeScript and AWS CDK
- Implemented access control using AWS IAM and secured website via web app firewalls and client-side encryption
- Migrated over 90% of legacy users and achieved a 10-fold reduction in average turnaround time for customers

Undergraduate Researcher Jan 2023 – May 2024
Laboratory for Intelligent Decision and Autonomous Robots

- Investigated implicit neural scene representation for SLAM systems and safe navigation planning for quadrupeds
- Leveraged Mask R-CNN for object instance segmentation and mask generation in 3D indoor space reconstructions
- Adapted vectorized mapping for NeRF-SLAM to 50 multi-instance object classes via geometric prior aggregation
- Implemented deep reinforcement learning algorithm for decentralized multi-robot collision avoidance in unpredictable environments and benchmarked performance against gap-based planners using ROS, STDR, and Stage

Machine Learning Engineering Intern May 2023 – Jul 2023
EXL Service

- Collaborated with Xtrakto.AI team to build domain-agnostic document processing solutions using PyTorch and AWS
- Researched and benchmarked 20+ multimodal models for key information extraction from medical and insurance documents and achieved 95% F1 score using LayoutLMv3
- Implemented training and inference pipelines for custom model creation and integrated with front-end platform
- Applied few-shot learning to document image classification and custom NER for accurate data-constrained inference

Projects

Vasuki: Minimizing Makespan for Offline LLM Batch Inference | *PyTorch, Vidur, CUDA, C++, Python*

- Designing system for offline LLM batch inference using bin packing, task reordering, and speculative decoding

Multi-Level Layer-Wise Quantization for CNNs | *PyTorch Edge, TensorFlow Lite, Quanto, QKeras, ONNX*

- Formulating novel heuristic to estimate layer importance and exploring multi-level quantization (3+ levels) for CNNs

Skills

Languages: Python, Java, C++, C, TypeScript (React, Node.js), SQL, C#, MATLAB, Bash, Smithy
DevOps/Cloud: Git, Docker, AWS, Microsoft Azure, Google Cloud, REST APIs, Jira
Frameworks/Libraries: OpenCV, NumPy, pandas, scikit-learn, TensorFlow, PyTorch, Matplotlib, ROS, CUDA, MPI
Hardware/Infrastructure: OLCF Frontier, NERSC Perlmutter, Raspberry Pi, Arduino, Industrial Control Systems
Concepts: Deep Learning, Computer Vision, Natural Language Processing, Reinforcement Learning, Data Structures and Algorithms, Computer Architecture, Optimization, High-Performance/Parallel Computing, Distributed Computing