Ashwin Mudaliar

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EDUCATION

Georgia Institute of Technology   Atlanta, GA
M.S. Computer Science (Machine Learning)   *May 2027*
B.S. Computer Science & B.S. Mathematics (AI/ML, Systems + Architecture, Pure Mathematics)   *May 2026*
- GPA: **3.88/4.0** | SAT: **1600/1600**
- Relevant Coursework: Deep Learning, Operating Systems, Machine Learning, Probability/Statistical Theory

EXPERIENCE

Amazon   May 2025 - Present
Software Development Engineering Intern   *Seattle, WA*
- Developed a CLI tool to bootstrap React Native/HTML components to **reduce development time** by over **20%**
- Built a CLI to bootstrap component monorepos and externalize builds, standardizing setup for 1000+ teams
- Built tool to simulate product rendering on iOS/Android and Web for 1000+ teams, **reducing errors by 50%**

Georgia Institute of Technology - College of Computing   Jan 2024 – Present
Undergraduate Teaching Assistant   *Atlanta, GA*
- Teaching Advanced Algorithms, previously Data Structures, reinforcing amortized analysis, NP-completeness, etc.
- Lead weekly recitations for **30+ students** spanning lists, trees, hash maps, graphs, dynamic programming, etc

Georgia Institute of Technology - Photonics and Terahertz Group   May 2024 - Aug 2024
Undergraduate Research Assistant   *Metz, France*
- Built a THz imaging pipeline for non-destructive defect detection using custom PSF modeling and Fourier optics
- Applied physics-informed Gaussian PSFs with FFT filtering with Richardson-Lucy deconvolution to sharpen image
- Implemented pipeline in **Python** using LANCZOS resampling and frequency-domain denoising to enhance clarity

Software Development Project Manager   Dec 2023 – Present
Alpha Kappa Psi - Epsilon Sigma Chapter   *Atlanta, GA*
- Led development of **Node.js** system to enable real-time points tracking across **120+ users** using **AWS lambdas**
- Developed a unified login service to streamline account management with **Node.js**, **JWT auth** and **PostgreSQL**

PROJECTS

Efficient LLaMa 3.2 Fine-Tuning | *PyTorch, Hugging Face, PEFT, Python*   March 2025 – April 2025
- Fine-tuned a LLaMa 3.2 model via Context Distillation + LoRA, improving advanced math accuracy by **10+%**
- Optimized Hugging Face PEFT pipeline with 4-bit quantization, reducing training and inference costs by **30%**
- Built custom KL divergence loss and symbolic evaluation tools to benchmark generative model outputs.

Linux-Based Kernel Enhancements | *C, x86, OS Design, Virtual Memory, Threading*   Jan 2025 - April 2025
- Engineered a **copy-on-write** forking mechanism and **lazy zero-page allocation** to **optimize memory usage**
- Designed and implemented **multi-core** CPU-aware preemptive FIFO and Round Robin **scheduling** with priority
- Implemented **kernel-level threading** and **user-space threading** library with mutexes and condition variables

GT AKPsi Rush Application | *TypeScript, React, Rust, AWS Lambda/S3, PostgreSQL*   Dec 2024 – Jan 2025
- Developed a real-time applicant tracking system to streamline recruitment process, increasing capacity **100+%**
- Implemented performant Rust APIs with Axum, enabling < 50**ms** access to PostgreSQL-backed applicant data
- Used React to build an accessible and fast experience for **500+ users**, handling over 2 million API invocations.

Raspberry-Pi Thermal Camera | *Python, OpenCV, Matplotlib, NumPy*   Dec 2022 - March 2023
- Constructed and programmed a Raspberry-Pi based thermal camera that identifies regions of inflammation
- Applied advanced interpolation algorithms to increase the effectiveness of the camera by over 50 percent
- Presented device at HOSA (Healthcare) State Leadership Conference placing 4th in Medical Innovation

SKILLS

Software: PyTorch, HuggingFace, React, MongoDB, Express, AWS, Node.js, Flutter, NumPy, Vite, Git, Quartus
Programming: C/C++, Java, Python, Rust, JavaScript, TypeScript, x86 Assembly, Dart, HTML/CSS, SQL, VHDL
Languages: English, Tamil
Awards: US Presidential Scholar Finalist, Nationally Ranked Squash Athlete, 1600+ Leetcode Rating