Karthik Thyagarajan

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EDUCATION

Purdue University

August 2024 - May 2027

B.S. of Computer Science & Artificial Intelligence - 4.0 GPA

West Lafayette, Indiana

Relevant Coursework: Data Structures and Algorithms, Computer Architecture, Programming in C, Linear Algebra

SKILLS

- AI/ML: LLM (LangChain, RAG, CoT/Reasoning, RLHF), Agents, MCP, PyTorch, Tensorflow, GAN, RL, Diffusion, Graph Neural Networks
- Data Science: Numpy, Pandas, PostgreSQL, NoSQL
- Languages & Frameworks: Python, Java, C++, C, JS/TS, HTML/CSS, React, Flask, Gradle
- Other: REST API, AWS System Design, GCP, OAuth, Git, Docker, Linux

EXPERIENCE

• Machine Learning Engineering Intern

Jun 2025 - Present

Silver Spring, MD

- *Peraton Labs (Internship & Part-Time Co-op)* Developed a novel reinforcement learning (RL) agent for IoT malware detection, reducing exploration latency by 35% and increasing detection coverage by 25% compared to brute-force baselines.
- · Built a heterogeneous graph neural network with autoencoders to model inter-device relationships and accelerate RL policy convergence, improving anomaly detection accuracy.

• Computer Vision Software Engineer

Feb 2025 - Aug 2025

Remote

Memories.ai (Part-Time)

- Engineered and deployed a scalable video memory framework for AR applications, enabling persistent spatial and contextual awareness while optimizing throughput for speed and scalability.
- Designed and published a Python SDK for the Mavi platform (https://pypi.org/project/pymavi/), streamlining developer workflows for video analysis.

• Undergraduate Robotics Researcher

IDEAS Lab, Purdue University (Part-Time)

Mar 2025 - Jun 2025

West Lafayette, IN

- Built real-time SLAM and novel view-synthesis pipelines in Python and C++, improving 3D scene reconstruction accuracy by 25% while ensuring deployment safety and reliability.
- · Optimized autonomous navigation algorithms, reducing mapping latency through performance tuning.

• ML Science & Engineering Apprenticeship

Naval Research Laboratory (Full-Time)

Jun 2023 - Aug 2023

Washington, D.C.

- · Led a 4-member team applying UNets, Transformers, and GANs to underwater acoustics, improving transmission loss prediction accuracy by 20% compared to physics-based models.
- · Prototyped and deployed a secure Retrieval-Augmented Generation (RAG) system, ensuring data confidentiality and operational reliability.

PROJECTS

Sep 2025

Tools: React Native, Python, LangGraph, GPT-5, AWS S3, QR-based encryption

github.com/karthikcsq/Caladrius

- Designed and implemented a cross-platform AI triage assistant that integrates medical history via encrypted QR-based data transfer, reducing data exposure through a least-exposure framework.
- · Built a multi-agent LLM pipeline to dynamically generate diagnostic questions and produce differential diagnoses with confidence scores, improving triage accuracy and prioritization in emergency settings; awarded 2nd Place in HackGT 12's track for social impact.

Frontera

Ongoing frontera.app

Tools: Next.js, TypeScript, FastAPI, LangChain, Firebase, React, NoSQL

- Founding engineer for Frontera, a "Cursor for projects" integrating an AI assistant for roadmap updates, intelligent planning, and issue-solving, alongside cofounder/talent matching, project discovery, and community features.
- · Built an AI agent ecosystem using LangChain and FastAPI integrated with Firebase authentication, REST APIs, and a React-based workspace interface to enable real-time roadmap updates and intelligent task resolution.