

# Karthik Thyagarajan

karthik6002@gmail.com | +1-703-951-7237

 [github.com/karthikcsq](https://github.com/karthikcsq) |  [linkedin.com/in/karthikthyagarajan06](https://linkedin.com/in/karthikthyagarajan06) | [www.karthikthyagarajan.com](http://www.karthikthyagarajan.com)

## EDUCATION

### Purdue University

May 2027

B.S. of Computer Science & Artificial Intelligence (Double Major) - 3.93 GPA

West Lafayette, Indiana

**Courses:** Data Structures & Algorithms, Computer Architecture, Programming in C, Competitive Programming, OOP

## EXPERIENCE

### • Peraton Labs

Jun 2025 - Present

Machine Learning Engineering Intern

Silver Spring, MD

- Developed RL agent for IoT malware detection using PyTorch and graph neural networks, reducing exploration latency by 35% and increasing detection coverage by 25% across 500K+ daily device events.
- Built large-scale data analytics ETL pipelines and heterogeneous graph architecture with autoencoders to model device communication patterns, accelerating policy convergence by 40%.

### • Memories.ai

Feb 2025 - Aug 2025

Computer Vision Researcher

Remote

- Architected video memory framework for AR applications processing 10K+ streams using Python, Flask, and PostgreSQL, achieving 60% throughput improvement through frame sampling optimization.
- Published Python SDK on PyPI with 2K+ downloads, implementing async processing and REST API integration for video analysis workflows.

### • AgRPA

Aug 2024 - Dec 2024

Undergraduate Data Engineer

West Lafayette, IN

- Built weed detection pipeline processing 200GB+ drone imagery with Python, TensorFlow, and PostgreSQL, optimizing ETL workflows for 40% faster retrieval.
- Engineered U-Net and YOLOv11 segmentation models achieving 92% accuracy on 50K+ images through agile sprints, reducing herbicide usage by 60% and costs by \$150K annually.

### • Naval Research Laboratory

Jun 2023 - Aug 2023

ML Science & Engineering Apprenticeship

Washington, D.C.

- Led 4-engineer team developing UNet, Transformer, and GAN models for underwater acoustics, improving transmission loss prediction accuracy by 20% over physics-based simulations.
- Architected secure RAG system with LangChain and vector embeddings for classified document retrieval, reducing query response time by 65%.

## PROJECTS & CLUBS

### • Repple

Ongoing

Tools: Python (FastAPI), Supabase, PostgreSQL, OpenAI API, Pydantic

[www.linkedin.com/company/reppleapp](https://www.linkedin.com/company/reppleapp)

- Built FastAPI and PostgreSQL backend with real-time game state synchronization for iOS app with 200+ active users.
- Developed a competitive gamification engine featuring custom ELO matchmaking algorithms, automated cron-based point aggregation, and generative AI workout plans that adapt to user performance metrics.

### • buildpurdue

Ongoing

Tools: Next.js, PostgreSQL, Supabase, UI/UX Design, Leadership, Mentorship

[buildpurdue.org](https://buildpurdue.org)

- Co-founded a campus accelerator supporting 15 student startups, providing resources that enabled teams to validate core problems and refine go-to-market strategies.
- Forged partnerships with 4 VC firms and industry mentors, creating a direct pipeline for student founders to secure feedback and potential pre-seed funding.

### • Caladrius (HackGT - 2nd Place)

Sep 2025

Tools: React Native, Python, LangGraph, GPT-5, AWS S3, REST API, Next.js

[github.com/karthikcsq/Caladrius](https://github.com/karthikcsq/Caladrius)

- Architected cross-platform AI triage app with encrypted QR-based data transfer and zero-knowledge architecture for HIPAA compliance.
- Built multi-agent diagnostic system with LangGraph achieving 85% triage accuracy when compared to symptom analysis data.

## SKILLS

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- **Languages:** Python, Java, C/C++, JavaScript, SQL, React, Flask, Next.js
- **Cloud & DevOps:** AWS, S3, EC2, Lambda, GCP, Docker, Git, CI/CD, Linux, REST API
- **AI/ML:** LLM (LangChain, RAG, CoT/Reasoning, RLHF), Agents, MCP, PyTorch, GAN, RL, Diffusion