Karthik Thyagarajan

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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*

  Data Engineering Intern West Lafayette, IN

  ◦ Built end-to-end weed detection pipeline processing 200GB+ drone imagery with Python and cloud storage, implementing parallel ETL workflows and optimized data partitioning for 40% faster retrieval and analysis.

  ◦ Engineered 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.

  ◦ Developed novel ML algorithms for underwater acoustics, improving transmission loss prediction accuracy by 20% over physics-based simulations.

  ◦ Built LangChain RAG system for classified document retrieval, reducing query time by 65%.

PROJECTS & CLUBS

- **Repple** *Ongoing*

  Tools: Python (FastAPI), Supabase, PostgreSQL, OpenAI API, Pydantic www.linkedin.com/company/reppleapp

  ◦ Built FastAPI and PostgreSQL backend with synchronized multiplayer functionality 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

  ◦ Co-founded a campus accelerator for 15 student startups, providing resources to validate core problems and refine go-to-market strategies.

  ◦ Forged partnerships with 4 VC firms and industry mentors, allowing 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

  ◦ Architected AI triage system with encrypted, zero-knowledge data transfer for HIPAA compliance.

  ◦ Built multi-agent diagnostic system with LangGraph achieving 85% triage accuracy on symptom analysis.

SKILLS

- **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