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*
  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

- **Repple** *Ongoing*
  Tools: Python (FastAPI), Supabase, PostgreSQL, OpenAI API, Pydantic 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, Vercel, Supabase, PostgreSQL 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
  ◦ 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, integrating REST API backend with AWS S3 for secure storage.

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