# Karthik Thyagarajan

karthik6002@gmail.com | kthyagar@purdue.edu

github.com/karthikcsq | linkedin.com/in/karthikthyagarajan06 | www.karthikthyagarajan.com

## EDUCATION

**Purdue University** — *August 2024 - May 2027*
*B.S. Computer Science & Artificial Intelligence - 4.0 GPA* — West Lafayette, Indiana
**Relevant Coursework:** Data Structures & Algorithms, Systems Programming, Database Systems, Computer Architecture, Linear Algebra

## SKILLS

- **Programming & Frameworks:** Python, Java, C++, C, JavaScript / TypeScript, React, Next.js, Flask, FastAPI
- **Data Engineering & Analysis:** SQL / PostgreSQL, NoSQL (Firebase, MongoDB), Pandas / NumPy, ETL Pipelines, RESTful APIs, Data Modeling
- **Machine Learning & AI:** PyTorch, TensorFlow, LangChain / RAG / Agents, Reinforcement Learning, Graph Neural Networks, Generative AI (Diffusion, GANs)
- **Cloud & DevOps:** AWS (S3, EC2), GCP, Docker, OAuth, Git / GitHub, Linux

## EXPERIENCE

- **Machine Learning Engineering Intern** — *Jun 2025 - Present*
  *Peraton Labs (Internship & Part-Time Co-op)* — Silver Spring, MD
  - Integrated heterogeneous graph neural networks with ETL workflows for IoT telemetry ingestion and relationship modeling, reducing data processing time by 35% and improving feature extraction coverage by 25%.
  - Built Retrieval-Augmented Generation (RAG) vector databases for threat intelligence, enabling sub-second embedding search and increasing malware detection accuracy by 30%.

- **Computer Vision Software Engineer** — *Feb 2025 - Aug 2025*
  *Memories.ai (Part-Time)* — Remote
  - Architected a scalable backend with REST APIs and asynchronous pipelines for AR-based video processing, improving throughput by 2x and reducing latency by 40%.
  - Developed and published the open-source 'pymavi' Python SDK, enabling seamless API integration and automating video analytics workflows for 50+ developers.

- **Undergraduate Robotics Researcher** — *Mar 2025 - Jun 2025*
  *IDEAS Lab, Purdue University (Part-Time)* — West Lafayette, IN
  - Implemented SLAM and view-synthesis pipelines in Python and C++, improving 3D reconstruction accuracy by 25%.
  - Optimized autonomous navigation stack through performance tuning and low-latency mapping enhancements.

- **Undergraduate Data Engineer** — *Aug 2024 - Dec 2024*
  *The Data Mine Corporate Partners, Purdue University (Part-Time)* — West Lafayette, IN
  - Designed and deployed a full data pipeline for drone-based weed detection using TensorFlow, Python, and PostgreSQL, enabling 40% faster query performance.
  - Built semantic segmentation models that reduced herbicide use by 60% and improved detection efficiency by 50% versus prior systems.

- **ML Science & Engineering Apprentice** — *Jun 2023 - Aug 2023*
  *Naval Research Laboratory (Full-Time)* — Washington, D.C.
  - Led a 4-member team applying UNets, Transformers, and GANs to underwater acoustics, improving prediction accuracy by 20%.
  - Prototyped and deployed a secure RAG (Retrieval-Augmented Generation) system ensuring data confidentiality and operational reliability.

## PROJECTS

- **Frontera** — *Ongoing*
  *Tools: Next.js, TypeScript, FastAPI, LangChain, Firebase, NoSQL* — frontera.app
  - Founding engineer of Frontera, a "Cursor for projects" platform integrating AI-driven planning, roadmap updates, and cofounder/talent matching.
  - Built an AI agent ecosystem using FastAPI and LangChain with Firebase authentication, REST APIs, and real-time React interfaces for intelligent task resolution.

- **Caladrius** — *Sep 2025*
  *Tools: React Native, Python, LangGraph, GPT-5, AWS S3* — github.com/karthikcsq/Caladrius
  - Built a cross-platform AI triage assistant using QR-based encrypted medical data sharing, reducing data exposure risks.
  - Designed a multi-agent LLM pipeline for dynamic diagnostic generation, earning 2nd Place at HackGT 12 (Social Impact Track).