KARTHIK THYAGARAJAN

karthikthyagarajan.com | karthik6002@gmail.com | kthyagar@purdue.edu
linkedin.com/in/karthikthyagarajan06/ | github.com/karthikcsq

EDUCATION

- **Purdue University** *August 2024 - May 2027*
  B.S. of Computer Science & B.S. of Artificial Intelligence — 4.0 GPA West Lafayette, Indiana

SKILLS

- **Languages & Frameworks:** Python, Java, C++, C, JavaScript, TypeScript, Next.js, React, Flask, Gradle
- **AI/ML:** Pytorch, LLM (LangGraph, LangChain, RAG, CoT, RLHF), Agents, MCP, Transformers, GAN, RL, Diffusion, Graph Neural Networks
- **Data & Cloud:** SQL, PostgreSQL, NoSQL, AWS, GCP, Docker

EXPERIENCE

- **Machine Learning Researcher** *June 2025 - Present*
  Peraton Labs (Internship + Part-Time Co-op) Silver Spring, MD
  - Developed a reinforcement learning (RL) agent in Python with PyTorch to optimize IoT device navigation, reducing exploration latency from brute force by 35% and improving malware detection coverage by 25%
  - Implemented a heterogeneous Graph Neural Network (GNN) with autoencoders to model device relationships, improving RL policy convergence and malware detection accuracy.

- **Computer Vision Researcher** *February 2025 - August 2025*
  Memories.ai (Part Time) Remote
  - Designed and deployed a scalable computer vision pipeline for augmented reality (AR) applications, improving real-time video analysis throughput and latency.
  - Built and published a Python SDK on PyPI for the Mavi platform, enabling end-to-end developer workflows in video processing and machine learning integration.

- **Undergraduate Robotics Researcher** *March 2025 - June 2025*
  IDEAS Lab at Purdue University (Part Time) West Lafayette, IN
  - Built real-time SLAM and novel view-synthesis pipelines in collaboration with a cross-functional research team, improving scene reconstruction accuracy by 25% while ensuring reliable deployment.
  - Optimized mapping algorithms in C++ and Python for autonomous navigation, reducing processing latency and enabling scalable real-time performance.

- **ML Science and Engineering Apprenticeship (SEAP) Intern** *June 2023 - August 2023*
  Naval Research Laboratory (Full Time) Washington D.C.
  - Led a team of four in applying machine-learning models (UNets, Transformers, GANs) to underwater acoustics, improving transmission loss prediction accuracy by 20% compared to physics modeling.
  - Built and deployed a Retrieval-Augmented Generation (RAG) prototype using secure internal APIs, ensuring compliance with data confidentiality and system reliability requirements.

PROJECTS

- **In The Loop** *Ongoing*
  Tools: LangGraph, LangChain, Agentic AI, CoT Reasoning, React, Next.js github.com/karthikcsq/in-the-loop-frontend
  - Built an agentic AI platform in Python to reduce LLM token usage by optimizing clarification prompts, improving efficiency of large language models.
  - Developed a full-stack web application with React + Next.js frontend and streaming APIs for real-time communication.

- **Storytime.ai** *Ongoing*
  Tools: PostgreSQL, Vector DB, OpenAI, Next.js https://storytime-sepia.vercel.app/
  - Designed a backend vector database with PostgreSQL + embeddings to cluster news articles efficiently for timeline-based visualization.
  - Implemented an AI pipeline with OpenAI APIs to summarize and group related stories, reducing noise compared to keyword search.