

# KARTHIK THYAGARAJAN

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## EDUCATION

### • Purdue University

B.S. of Computer Science & Artificial Intelligence - 4.0 GPA

August 2024 - May 2027 (Expected)

West Lafayette, Indiana

## SKILLS

- **AI/ML:** LLM (LangChain, RAG, CoT/Reasoning, RLHF), Agents, MCP, PyTorch, Tensorflow, GAN, RL, Diffusion, Graph Neural Networks
- **Data Science:** Numpy, Pandas, PostgreSQL, NoSQL
- **Languages & Frameworks:** Python, Java, C++, C, JS/TS, HTML/CSS, React, Flask, Gradle
- **Other:** REST API, AWS System Design, GCP, OAuth, Git, Docker, Linux

## EXPERIENCE

### • Machine Learning Researcher

Peraton Labs (Internship & Part-Time Co-op)

Jun 2025 - Present

Silver Spring, MD

- Developed a novel reinforcement learning (RL) agent for IoT malware detection, reducing exploration latency by 35% and increasing detection coverage by 25% compared to brute-force baselines.
- Built a heterogeneous graph neural network with autoencoders to model inter-device relationships and accelerate RL policy convergence, improving anomaly detection accuracy.

### • Computer Vision Researcher

Memories.ai (Part-Time)

Feb 2025 - Aug 2025

Remote

- Engineered and deployed a scalable video memory framework for AR applications, enabling persistent spatial and contextual awareness while optimizing throughput for speed and scalability.
- 'Designed and published a Python SDK for the Mavi platform (PyPI':  
'https://pypi.org/project/pymavi/'), streamlining developer workflows for video analysis.'

### • Undergraduate Robotics Researcher

IDEAS Lab, Purdue University (Part-Time)

Mar 2025 - Jun 2025

West Lafayette, IN

- Built real-time SLAM and novel view-synthesis pipelines in Python and C++, improving 3D scene reconstruction accuracy by 25% while ensuring deployment safety and reliability.
- Optimized autonomous navigation algorithms, reducing mapping latency through performance tuning.

### • ML Science & Engineering Apprenticeship

Naval Research Laboratory (Full-Time)

Jun 2023 - Aug 2023

Washington, D.C.

- Led a 4-member team applying UNets, Transformers, and GANs to underwater acoustics, improving transmission loss prediction accuracy by 20% compared to physics-based models.
- Prototyped and deployed a secure Retrieval-Augmented Generation (RAG) system, ensuring data confidentiality and operational reliability.

## PROJECTS

### • In The Loop

Tools: Next.js, React, TypeScript, Tailwind CSS, Vercel

Ongoing

<https://in-the-loop-ai.vercel.app/>

- Developed a platform to streamline AI interactions by reducing token wastage and clarifying user intent, improving efficiency of LLM-driven workflows.
- Implemented streaming with a deployed LangGraph agent backend to handle within-thread communications and user interrupts.

### • Verbatim

Tools: OpenAI APIs, Google Cloud APIs, Next.js, Vercel

Feb 2025

<https://github.com/karthikcsq/verbatim>

- Created a multi-function video platform for summarization, translation, voice cloning, and lip-sync, deployed at <https://www.getverbatim.tech>.
- Automated workflows with Whisper (ASR), GPT-4o (summarization), Google Translate (translation), Eleven Labs (voice cloning), and Twelve Labs (video Q&A).