KARTHIK THYAGARAJAN

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EDUCATION

- **Purdue University** *Currently Pursuing*
  B.S. of Computer Science & B.S. of Artificial Intelligence — 4.0 GPA West Lafayette, Indiana

EXPERIENCE

- **Undergraduate Researcher** *March 2025 - Present*
  IDEAS Lab at Purdue University West Lafayette, IN
  - Researching advanced 3D mapping techniques to enhance robotic perception and novel view synthesis, aiming to improve scene reconstruction accuracy
  - Implementing real-time SLAM (Simultaneous Localization and Mapping) algorithms to enable autonomous navigation and scene understanding in robotic systems.

- **Computer Vision Researcher** *February 2025 - Present*
  OpenInterX Remote
  - Engineering a scalable video memory and understanding framework to enhance AR applications by enabling long-term spatial and contextual awareness
  - Designing and optimizing a Python SDK for the Mavi platform, streamlining video analysis workflows for developers

- **Undergraduate Data Science Researcher** *August 2024 - December 2024*
  The Data Mine Corporate Partners West Lafayette, IN
  - Collaborated with AgRPA to create a weed detection system using UAVs for farms.
  - Developed semantic segmentation and localization models to accurately locate weeds during real-time drone flight, speeding up ground-vehicle-based methods by 50%.

- **Science and Engineering Apprenticeship (SEAP) Intern** *June 2023 - August 2023*
  Naval Research Laboratory Washington D.C.
  - Led a team of four interns in the PALIS project, applying machine learning to underwater acoustics with a specific focus on the interaction between semantic segmentation and acoustic loss modeling.
  - Developed and implemented cutting-edge image-to-image translation models using UNets, Transformers, and GANs, improving transmission loss prediction accuracy by 20% compared to traditional physics-engine-based methods.
  - Implemented a secure Retrieval-Augmented Generation model that utilized confidential documents and information to respond to prompts.

PROJECTS

- **Verbatim** *February 2025*
  Tools: OpenAI/Google Cloud APIs, Miscellaneous APIs, Next.js, Vercel github.com/TheXDShrimp/verbatim
  - Developed a video understanding platform leveraging various APIs, deployed using Vercel at getverbatim.tech.
  - Created an automated pipeline with audio transcription (Whisper), translation (Google Cloud), summarization (GPT-4o), automatic voice cloning (Eleven Labs), lip sync (Sync.so) and video Q&A (Twelve Labs) for enhanced interactivity.

- **FORMulator** *November 2024*
  Tools: PyTorch, PoseNET, Flask github.com/karthikcsq/FORMulator
  - Created a real-time PoseNET-based comparison system to analyze movements and detect differences from the intended form.
  - Utilized Flask to build a webpage that users can record live video or upload videos to detect movement errors.

SKILLS

- **Programming Languages:** Python, Java, C++, C, Javascript, Next.js
- **Data Science & ML:** PyTorch, Tensorflow, OpenCV, Numpy, Pandas, SQL, R
- **Developer Tools & Version Control:** Git, Docker, Linux