Pranav Ponnusamy

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EDUCATION

Georgia Institute of Technology   Atlanta, GA
Bachelor of Science in Computer Science and Mathematics   *May 2028*
- **Relevant Coursework:** Machine Learning, Computer vision, Linear Algebra, Data Structures & Algorithms, Computer Organization, Object Oritented Programming,

TECHNICAL SKILLS

Languages: Java, Python, C/C++, JavaScript, Bash, HTML/CSS
Tools & Platforms: Git, AWS, Oracle Cloud, Vertex AI, SLURM, Firebase, Generative AI APIs (OpenAI, Gemini, Anthropic)
Frameworks & Libraries: PyTorch, NumPy, SciPy, Pandas, Matplotlib, BeautifulSoup, Django, Flask, FastAPI, React
Embedded Platforms: STM32 (Bare metal), Arduino (Bare Metal), Raspberry Pi Compute Module 4 (Linux)

EXPERIENCE

Undergraduate Researcher   May 2025 – Present
Duke NLP   *Durham, NC*
- Researching training-free methods for improving embeddings of images/videos for retrieval.

Undergraduate Research Assistant   Dec 2024 – May 2025
Mathematical Neuroscience Research Group   *Atlanta, Georgia*
- Researching pruning methods to increase sparsity of recurrent neural networks while preserving neural low-rank dynamics.

Founding Engineer   April 2024 – Present
Why.chat (Early-Stage Startup)   *Remote*
- Developed an LLM prompt pipeline, state-machine-based user interactions, and a low-latency real-time voice pipeline (ElevenLabs) enabling students to dynamically interact with an AI assistant to clarify story content and deepen comprehension.
- Founded at Harvard with guidance from Prod, David Malan, and Ali Partovi.

Embedded Software Engineering Intern   May 2022 – Aug 2023
iSENSYS, LLC   *Melbourne, FL*
- Implemented an algorithm in C++ to estimate wave heights using time series data from IMUs on low-cost data buoys.
- Implemented a ROS Noetic routine on a Raspberry Pi enabling an autonomous underwater vehicle (ArduPilot firmware) to detect and retrieve buoys using AprilTags.

PROJECTS

3rdEye: Driver Monitoring System | *Python, C++*   Aug 2021 – May 2024
- Developed an embedded real-time driver drowsiness and distraction detection system using EfficientNet (CNN) trained with PyTorch.
- Performed facial landmark detection with OpenCV and Histogram of Oriented Gradients (HOG), optimized for Raspberry Pi CM4.
- Integrated mmWave radar for heart-rate monitoring; analyzed Pulse Rate Variability (PRV) using SciPy, IFFT filtering, and power spectral density analysis.
- Learn more at bit.ly/3YFtBDK and bit.ly/3Ew1nn2.

WeSifted | *Python*   May 2024 – Present
- Developed a RAG (Retrieval-Augmented Generation) pipeline that analyzes legislative documents and generates actionable business insights, enabling companies to proactively comply to regulatory changes.
- Engineered the data processing pipeline using Hugging Face embedding models and Qdrant vector database, integrating Gemini for information synthesis and analysis.
- Deployed a scalable infrastructure on self-hosted servers with Oracle Cloud as the primary load balancer.
- Explore at wesifted.com

SafeMaps | *React Native, Flask, Firebase, NetworkX*   May 2022 – Sept 2024
- Collaborated with the Shreya Dixit Foundation to develop SafeMaps, an algorithm prioritizing safer navigation for new drivers by leveraging historical accident from state departments of transportation.
- Implemented an A* routing algorithm using NetworkX with a convergence-based heuristic that dynamically adjusts routes based on driver confidence.
- Visit at https://bit.ly/safermaps

AWARDS

ISEF: 2x Finalist, Special Award ($360,000 Scholarship)
Competitions & Honors: 1st Place @ PennApps 2024, 3rd Place @ CodeQuest 2023, National Merit Commended