Pranav Ponnusamy

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EDUCATION

Georgia Institute of Technology   Atlanta, GA
BS, Computer Science and Math   *May 2028 (Expected)*

West Shore Jr/Sr High School   Melbourne, FL
Rank: 1/140; GPA: 4.65; Courses: Calculus 3, Java, Data Structures & Algorithms, Discrete Math   *May 2024*

EXPERIENCE

Founding Engineer   April 2024 – Present
ZenLearner   *Remote*
- Developed a corrective RAG (Retrieval-Augmented Generation) pipeline using Chroma Database and LangChain to create fact-checked articles at various Lexile levels, tailored for students based on an age of acquisition analysis.
- Fine-tuning large language models (LLMs) with OpenAI GPT-4 and Hugging Face Transformers to serve as comprehension and debate chatbots to enhance student engagement with reading material.

President   May 2022 – Present
Shreya Dixit Memorial Foundation - Innovation Labs   *Remote*
- Collaborating with a team of interns to jointly develop SafeMaps, an algorithm that provides on-road navigation with a priority on safe routing, using historical accident data acquired from the Minnesota Department of Transportation.
- Led a team to design embedded hardware & software to analyze and alert drivers of behavioral trends associated with drowsy driving.

Signal Processing Intern   May 2022 – August 2023
iSENSYS, LLC   *Melbourne, FL*
- Developed an algorithmic approach using an Extended Kalman Filter (EKF) and time series data in C++ for wave height estimation using the IMUs on low-cost data buoys.
- Helped implement a routine in ROS Noetic to pilot an autonomous underwater vehicle (AUV) running ardupilot firmware to detect and retrieve buoys identified by aprilTags autonomously.

PROJECTS

3rdEye: Driver Monitoring System | *Python, C++*   August 2021 – Present
- Developed a real-time driver drowsiness and distraction detection system in Python, utilizing machine learning frameworks such as TensorFlow and Keras to implement and train a CNN based on the EfficientNet architecture for accurate vision-based detection.
- Utilized OpenCV for computer vision tasks, including facial landmark detection with Google's BlazeFace model and feature extraction with Histogram of Oriented Gradients (HOG), optimizing the pipeline for deployment on a Raspberry Pi platform
- Integrated mmWave radar technology for non-invasive heart rate monitoring, and utilized SciPy for signal cleaning with Inverse Fast Fourier Filter and Power Spectral Density (PSD) analysis to calculate Pulse Rate Variability (PRV) for proactive drowsiness detection.
- Learn more at bit.ly/3YFtBDK.

VerseAnalyzer | *Python*   May 2024 – Present
- Developing VerseAnalyzer, a tool for analyzing sentiments and themes in poetry, by utilizing BeautifulSoup to web scrape poems from literary websites.
- Preprocessed data using NLTK and SpaCy.
- Utilizing LLaMA3 to conduct sentiment and theme analysis to determine recurring themes and emotions in poetry.

TECHNICAL SKILLS

Languages: Java, Python, C/C++, JavaScript, HTML/CSS
Developer Tools: Git, Google Cloud Platform, VS Code, Visual Studio, PyCharm, IntelliJ, Eclipse
Frameworks/Libraries: Keras, SciPy, TensorFlow, Pandas, NumPy, Matplotlib, BeautifulSoup, Django, React
Awards: 2x ISEF Finalist, ISEF Special Award ($360,000 scholarship), 3rd Place @ CodeQuest 2023, National Merit Commended