Pranesh Velmurugan

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Education

Purdue University — West Lafayette, IN
Bachelor of Science in Computer Science and Data Science — *Graduation: May 2026*
Minor in Mathematics
Specialization in Machine Intelligence

Relevant Coursework: Object-Oriented Programming, Programming in C, Computer Architecture, Systems Programming, Operating Systems, Computer Networks, Databases, Intro to Data Science, Large-scale Data Analytics, Data Mining and Machine Learning, Artificial Intelligence, Data Structures and Algorithms, Analysis of Algorithms, Discrete Math, Multivariate Calculus, Linear Algebra, Real Analysis, Probability, Statistical Theory, Time Series

Experience

Amazon Web Services (AWS) — May 2025 – August 2025
Software Development Engineer Intern — *Bellevue, WA*

- **Built full-stack features** with **Spring Boot (Java), React (TypeScript), and DynamoDB** for a skills automation platform used by **7,000+ Support Engineers**
- **Developed Manager Hub** from **Figma** designs, enabling managers to track engineer progress and adoption
- **Designed and wrote 3 REST APIs** to support platform functionality and maintain a **99.999% SLA**
- Authored **JUnit** tests and **Jest** frontend test cases, improving code quality and reducing production bugs
- Utilized Docker and validated endpoints with Postman, strengthening CI/CD integration and deployment consistency

NASA — June 2024 – August 2024
Software Development Engineer Intern — *Greenbelt, MD*

- **Developed Python software that automated the generation and modification of satellite orbits, saving NASA scientists significant time and improving data accuracy for the ICESat-2 satellite mission**
- Software parses KML files and generates pointing plans for ICESat-2 and the Cryospheric Sciences Laboratory
- Utilized Shapely and FastKML libraries to automate processes, reducing **two months** of manual work to **seconds**
- Enhanced data processing capabilities, resulting in a **99%** reduction in manual data handling time

Purdue University (AI for Music) — January 2025 – Present
Team Lead, Undergraduate Researcher — *West Lafayette, IN*

- Developed a **robotic cello bowing system** using UR5e robotic arm, converting MIDI input into real-time bowing
- Built a **motion control pipeline** for trajectory generation and note transitions, enabling autonomous cello performance
- CADed and simulated the lab setup in **MuJoCo**, ensuring transfer of models between physical and virtual environments
- Implemented **imitation learning and PPO reinforcement learning** policies to optimize bowing techniques

Projects

AI Robot Assistant | *C++, OpenCV, MediaPipe, Gemini API, Mistral 7B, MCP, Vector DB*

- **Built a voice and vision-enabled robotic assistant** that combines real-time object recognition, natural language scheduling, and memory storage for interactive task execution
- Programmed precise robot movement in **C++**, enabling responsive control of a 3-DoF robotic arm
- Implemented visual perception with **OpenCV and MediaPipe**, allowing object recognition to guide robot actions
- Fine-tuned a local **Mistral 7B model** using synthetic datasets generated via the **Gemini API**
- Integrated **MCP server**, TickTick API, and **Vector DB** for natural-language scheduling and memory

Emotional Oranges | Devpost | *ReactJS, Firebase, TensorFlow, Kaggle*

- **Created React + Firebase web app that generates personalized Spotify playlist based on mood detected from an image uploaded by the user**
- Trained an image classification machine learning model using TensorFlow, leveraging a Kaggle dataset to detect moods
- Integrated Spotify API to fetch and curate playlists that match the detected mood, enhancing the user experience

SpaceCrafts-in-AR | GitHub | *Swift, ARKit, RealityKit*

- **Created an app that lets users view 3D spacecraft in the real world using their phone's camera, making space exploration interactive and fun**
- Developed an augmented reality iOS app using ARKit and RealityKit to visualize spacecraft models in the real-world
- Utilized and integrated NASA spacecraft models

Technical Skills

Languages: Python, Java, C, C++, JavaScript, TypeScript, Swift, HTML, CSS, SQL, R
Frameworks: ReactJS, Spring Boot, Flask, TensorFlow, Mediapipe, JUnit, Pytest
Tools: Git, GitHub, Firebase, Figma, Vite, Tableau, Linux, REST API
Libraries: Pandas, NumPy, Matplotlib, Scikit-learn, OpenCV