Akhila Pingali

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PROFILE SUMMARY

Final-year B.Tech student in Electronics & Communication Engineering with hands-on experience in full-stack AI systems, real-time robotics, and human-centered UX. Proven ability to ship production-ready tools across frontend, backend, and embedded environments. Passionate about building scalable, intuitive, and high-performance applications at the intersection of AI, hardware, and design.

EDUCATION

B.Tech in Electronics and Communications *2021 - 2025*

Vellore Institute of Technology, Vellore *CGPA:8.46*

WORK EXPERIENCE

Python and AI developer Intern at Machani Robotics (RIA the humanoid) *January 2025 – July 2025*

- Built Python-based AI pipelines integrating **emotion detection (FER)**, **face tracking (InsightFace)**, and **voice DOA** using **ROS 2**.
- Designed containerized systems with **Docker Compose** to orchestrate **vision, servo, and TTS subsystems** in real-time.
- Developed proactive interaction flows using **gaze, engagement scores**, and **LangChain RAG** stack.
- Fine-tuned **Mistral-based LLMs** for embedded conversational agents with low-latency performance.

IoT developer Intern at Infinos Tech (IIIT-Hyderabad) *August 2023 – September 2023*

- Built a dual-environment climate control system using **Python**, **NodeMCU**, and **ESP32**.
- Optimized hardware-software integration to reduce system errors by 20%.

PROJECT EXPERIENCE

Entropy – An Ideation SaaS Platform (Website: https://entropyidea.com)(Role: Founder & Lead Engineer)

- Developed a full-stack web application enabling users to branch linear AI chats into non-linear mind maps with modular LLM architecture and a sticky-note UI.
- Engineered real-time user interaction with client-side embeddings, vector search, and reranking, achieving sub-100ms latency and seamless context switching.
- Designed intuitive frontend UX with React-like architecture (Next.js-compatible), tree visualization, and persistent conversation threads.
- Built and deployed the entire platform to production (Vercel), demonstrating full product ownership and systems design.

Proactive Humanoid Development

- Created a multi-service robotic interaction pipeline integrating face recognition, voice localization, emotion detection, and gaze tracking.
- Modularized code into ROS 2 nodes with native pub/sub architecture, enabling proactive gestures, speech, and human-aware behavior logic.
- Designed and deployed containerized systems (Docker Compose) for vision, speech, and actuator modules on Linux-based platforms.
- Focused on real-time performance and robustness—validated through real-world tests on humanoid platforms.

Integrated Face and Voice DOA Servo Control System (Python + ROS2)

- Developed real-time servo alignment logic using **MediaPipe**, **Intel RealSense**, and **ReSpeaker Mic Array**.
- Built fallback logic between face vs voice-based tracking using **Python ROS 2 nodes**.

Research Paper- MEMS capacitive pressure sensor (published on Research Gate) -
https://www.researchgate.net/publication/385362217_MEMS_capacitive_pressure_sensor_analysis_theoretical_modeling_simulation_and_performance_comparison_of_the_effect_of_a_conical_notch

Review Paper- Enhancing Antenna Performance

- A Comprehensive Review of Metamaterial Utilization

SKILLS

- **Languages:** Python, C++, JavaScript, TypeScript, Rust (familiar), Bash
- **Frontend:** HTML, CSS, JavaScript (React-style), UI design principles, WebSocket
- **Backend:** REST APIs, LangChain, RAG pipelines, Redis, Docker
- **Systems & Tools:** Linux, ROS2, Git, Docker, RealSense SDK, WhisperX, Vercel
- **Frameworks:** ROS2, OpenCV, LangChain, Pinecone, FAISS, Mediapipe
- **Collaboration:** GitHub, Figma (basic), Agile, VS Code, Docker Compose
- **Testing:** End-to-End test design (manual and scripted), debugging complex pipelines
- **Other:** Emotion Recognition, Voice DOA, Depth Estimation, AI pipelines, client-side retrieval

CERTIFICATIONS and OTHER INTERESTS

- Google Data Analytics
- Design Thinking - For Innovators (Coursera)
- Skill badges in AI/ML on Google Cloud
- IBM Web Development
- Western Violin Trinity Certified (Grade 2), College Volleyball team player
- Delft University of Technology: Introduction to Aerospace Structures and Materials
- Active member of The Planetary Society