

Maanas Nair

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EDUCATION

Vellore Institute of Technology

B.Tech, Computer Science & Engineering (IoT) | **CGPA: 9.01**

Vellore, TN

2024 – 2028

St. Mary's Convent Sr. Sec. School

Grade 12: 91.2%

Dewas, MP

2022 – 2024

EXPERIENCE

IoT Research Intern

Feb 2025 – Aug 2025

MyPerro (Shark Tank India)

Vellore, TN

- Built signal processing firmware on a 60 GHz radar sensor (Infineon BGT60TR13C) to monitor canine heart rate and breathing with ± 0.5 bpm accuracy.
- Reduced per-unit connectivity costs by 18% by integrating three separate connectivity modules into one custom PCB with the SIMCOM A7672S (LTE/GPS); designed battery management system for LiFePO4 cells and evaluated NavIC as a GPS alternative.

CTF Infrastructure Contributor

Aug 2021 – Oct 2022

HackArmour (an open-source community project)

Indore, MP

- Designed and developed Vipin, an OpenVPN-based network system that isolated 200+ concurrent CTF players into separate sandboxed networks with mutual TLS authentication, preventing team-to-team data leakage.
- Configured iptables firewall rules to enforce strict subnet boundaries and block lateral movement between teams.

PROJECTS

Sanskrit ASR: Vocal Transcription System

Jan 2026 – May 2026

- Reduced word-error-rate from 41.7% to 28–32% by replacing Whisper's generic vocabulary with a custom 8,192-token Sanskrit tokenizer based on phoneme units, removing intermediate English transliteration steps.
- Extracted vowels from recordings with background drone interference using dual-stream feature extraction with 160 frequency channels (log-Mel + harmonic separation), trained on RTX 5060 Laptop GPU with 8GB VRAM.
- Reduced phonologically invalid outputs from 3.2% to 0.1% by adding phoneme-level validation at inference; compressed model to 8 MB INT8 ONNX with 38 ms median CPU latency per 3-second chunk.

YatriSuraksha: Tourist Safety & Digital ID Platform (Smart India Hackathon 2025)

Sep 2025 – Oct 2025

- Built the backend ingest pipeline in Go (Fiber framework), connecting WebSocket and NATS JetStream to route GPS/SOS events to the dashboard and safety-scoring service.
- Achieved sub-100ms p99 latency at 500 concurrent dummy connections.
- Designed ERC-721 smart contracts in Solidity for time-bound, KYC-linked tourist IDs and an immutable on-chain ledger for E-FIR incident records.

PATENT APPLICATIONS

IN202641068109 A1 (Sanskrit ASR system); IN202641056125 A1 (infrared eye-blink assistive communication device)

TECHNICAL SKILLS

Embedded & IoT: ESP32, Arduino, I2C/SPI/UART/PWM, PCB design, battery management, firmware

ML & AI: PyTorch, TensorFlow, CUDA, speech models, signal processing, prompt engineering

Backend: Go (Fiber), REST APIs, WebSocket, NATS Messaging, OpenVPN

Languages: Python, C, C++, Java, SQL

Cloud & DevOps: AWS, Docker, Kubernetes, Git, GitHub, CI/CD