SHIYAMALADEVI R S

📞 +91-8072286109 ✉ shiyamaladevirs@gmail.com in linkedin Portfolio ⊙ github

Education

Vellore Institute of Technology
Ranked 142nd globally for Engineering & Technology (QS 2025) and 16th in India for Engineering (NIRF 2025)
Bachelor of Technology in Electronics and Communication Engineering — CGPA:8.52/10   **Apr 2025**
- **Final Semester GPA: 10.0/10** — 163 credits earned
- **Relevant Coursework**: Machine Learning, Digital Signal Processing, Digital System Design, Digital Communication, Information Theory, IoT, Computer Networks.

Honors & Awards

Best Paper Award — IEEE ICCCSMD 2024   **Dec 2024**
- **Presented** research paper *"Alleviating Muscle Fatigue in Robotic Prosthetic Arms Through Multi-Sensor Fusion and Adaptive Real-Time Grip Assistance"* at *IEEE - International Conference on Communication, Computing, Smart Materials and Devices* 2024 and received the Best Paper Award.

Research Experience

Summer Research Assistant   **May 2025 – Aug 2025**
Center for Neuroinformatics, Vellore Institute of Technology   *Chennai, India*
- Designed **cryptographically-secured federated learning framework** using HMAC-SHA256 and AES-256, enabling privacy-preserving model training across 25 simulated medical devices (HIPAA/GDPR-compliant)
- Developed **ultra-lightweight CNN (0.54 MB, 140K parameters)** optimized for Raspberry Pi, achieving **< 15 milli-seconds inference latency** and **98%+ clinical accuracy** in real-time seizure detection
- Implemented **Byzantine fault-tolerant aggregation system** with dynamic trust scoring, achieving **97.5% accuracy** in no-attack scenarios and **95.2% under 30% malicious clients** with **98.7% attack detection rate**

Research Intern   **Jan 2024 – Apr 2024**
Odyssey Labs   *Remote*
- Explored an innovative **negative cache approach**, gaining insights into **optimizing retrieval model efficiency**.
- Learned to develop and implement a **neural style transfer** model using TensorFlow Hub, observing notable improvements in speed and accuracy.

Industry Experience

Supply Chain Machine Learning Intern   **Feb 2025 – Jun 2025**
Flipkart   *Chennai, India*
- Engineered Python tool processing **1.3M records** across multiple hubs, reducing processing time from **5 hours to 200 seconds (99.8% reduction, 432× efficiency boost)**, saving significant operational capital
- Developed and deployed **transfer learning-based image classification pipeline** for Open Box Delivery quality assurance, achieving **89% overall accuracy and 96% recall** for low-quality images using fine-tuned ResNet50
- Built end-to-end automated workflow integrated with Google Sheets, enabling non-technical operators to run real-time quality checks, **reducing manual inspection overhead by 60%**

AWS Project Intern   **Aug 2023 – Dec 2023**
Ethnus   *Remote*
- Implemented **Amazon EC2** and **Elastic Beanstalk** to host **E-Health Record Management System**, utilized **S3** for diagnostic image storage with role-based access control
- Leveraged **AWS RDS**, **Lambda**, and **CloudWatch** for robust, scalable healthcare system architecture

Instrumentation Intern   **Sep 2023 – Oct 2023**
Saipem India Projects Pvt Ltd   *Chennai, India*
- Ensured compliance with engineering specifications through **P&ID checks** and streamlined **data sheet validation**
- Built foundation in oil & gas operations, control systems, and instrumentation using Smart Plant software

Patent

A System for Prosthetic Arm with Non-Invasive Sensory Regeneration   **202541009214 · Issued Feb 14, 2025**

- This system restores the sense of temperature and grip force in prosthetic arm users without any surgical implants. Using EMG (Electromyography) signals, the prosthetic arm detects muscle activity for gripping functions and also regenerates sensations of heat, cold, and grip pressure in real time. This allows users to feel the temperature of objects they touch and precisely control grip force, bridging the gap between human sensation and assistive technology

Publications & Manuscripts

- *Manimaran, P., Ashwin, J. B., Swaroop, S. K., & Shiyamaladevi, R. S. (2024, December). Alleviating Muscle Fatigue in Robotic Prosthetic Arms Through Multi-Sensor Fusion and Adaptive Real-Time Grip Assistance. In 2024 International Conference on Communication, Computing, Smart Materials and Devices (ICCCSMD) (pp. 1-12). IEEE.* ***DOI:*** *10.1109/ICCCSMD63546.2024.11015135*

- *Shiyamaladevi R S. Swara-Net: A Deep Learning Baseline and Curated Dataset for Five Under-Represented Carnatic Ragas. TechRxiv. October 31, 2025.* (Selected for Dec IEEEINDICON'2025) ***DOI:*** *10.36227/techrxiv.176281084.44193627/v1*

- *Shiyamaladevi R S, Jeetashree Aparajeeta. Automated Classification of E-Commerce Packaging for Open Box Delivery: A Transfer Learning Solution. TechRxiv. November 10, 2025.* ***DOI:*** *10.36227/techrxiv.176281084.44193627/v1*

- *Shiyamaladevi R S, Swaroop S Kaimal, Jeetashree Aparajeeta. Security Auditing and Ultra-Strict Malicious Client Blocking in Federated EEG Seizure Detection. TechRxiv.* (***Under review at Frontiers***)

Projects

DreamWeavers - AI Story Teller   🌐 **https://kids-stories-phi.vercel.app/**

- Developed an AI-powered web application to generate personalized, illustrated children's bedtime stories using GROQ and the Mixtral model.

- Engineered key features including text-to-speech (TTS) for audio narration, a persistent story library, and a PDF download option for offline access.

Environmental Guardian   🌐 **https://environmentalguardian.onrender.com/**

- Developed an interactive climate action game featuring a live emergency dashboard monitoring real-time data from 110+ global coastal cities.

- Built and deployed the full-stack application using PythonAnywhere for backend services and Render for public hosting and accessibility.

Technical Skills

Programming Languages: Python, SQL, Java, MATLAB, C
Machine Learning/AI: TensorFlow, Scikit-learn, CNNs, TimeSeries Forecasting, Federated Learning, Transfer Learning, PyTorch, Edge AI, Tiny ML
Cloud & Big Data: AWS (EC2, S3, RDS, Lambda, Elastic Beanstalk, CloudWatch), Google Cloud
IoT & Embedded Systems: Arduino, ESP32, Raspberry Pi, Sensor Data Processing, Real-time Systems
Data Visualization: PowerBI, Tableau, Excel, Google Sheets, Matplotlib, Seaborn
Cryptography & Security: AES-256, HMAC-SHA256, Byzantine Fault Tolerance, Privacy-Preserving ML
Other Tools: Git/GitHub, Docker, Flask, Data Cleaning, Feature Engineering, LaTeX

Leadership & Extracurricular

Fellowship Member — Your Big Year   **Jan 2024 – Present**
- Collaborating with global youth leaders on sustainability and social impact initiatives

Section Leader – Stanford Code in Place   **Apr 2025 – Jun 2025**
- Selected from global applicant pool to lead 6-week Python programming section for students across globe, teaching core concepts including variables, control flow, functions, lists, and dictionaries. Facilitated weekly interactive coding sessions, provided personalized feedback, and supported diverse learners through hands-on exercises

School Team Member — VITeach   **Sep 2023 – Dec 2024**
- Supported educational outreach by visiting rural schools and developing study materials for underprivileged students