

Sanjula Liyanage

AI/ML Engineering · Computer Vision · Edge AI · Robotics & Automation

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PROFESSIONAL SUMMARY

Final-year Electronics & Information Technology undergraduate at the University of Colombo who builds AI systems that run on real hardware, from an LLM-driven assistive device on ESP32 to YOLOv8 licence-plate recognition and PLC-controlled machinery. Strong foundation in machine learning and deep learning, with hands-on work in computer vision, RAG/LLM agents and embedded systems, plus industry experience annotating production computer vision datasets at Surge Robotics (Idea8). Seeking an AI/ML Engineering or Robotics & Automation internship focused on Edge AI, industrial robotics and Physical AI.

EDUCATION

University of Colombo — BSc (Hons) Electronics & Information Technology | Expected graduation: May 2027

Relevant coursework: Machine Learning, Deep Learning, Computer Vision, Robotics & Automation, Industrial Automation, Advanced Database Systems

TECHNICAL SKILLS

- **AI & Computer Vision:** CNNs, YOLOv8, OpenCV, OCR, Image Processing, Machine Learning, Deep Learning, TensorFlow, PyTorch, Keras, scikit-learn, NumPy, Pandas
- **Generative AI:** RAG, LLM Agents & Function Calling, LangChain, LangGraph, ChromaDB, llama.cpp (local LLMs)
- **Programming:** Python, C, C++, Embedded C, Java, JavaScript, PHP, Jakarta EE
- **Embedded & Robotics:** ESP32, ESP32-S3, ESP32-CAM, ATmega328P, PlatformIO
- **Industrial Automation:** PLC (Xinje XD3, Fatek), Ladder Logic, VFD Motor Control, Kinco HMI
- **Tools:** FastAPI, React, Git, GitHub, pytest, Jira, ClickUp, Android Studio

PROJECTS

Smart Cane – AI Navigation Aid for the Visually Impaired | ESP32-S3, ESP32-CAM, Computer Vision, LLM Agents

- Built a voice-driven AI assistant on an LLM agentic function-calling workflow, so users control navigation by speech.
- Developed camera-based indoor navigation on the ESP32-CAM using custom landmark recognition, paired with Google Maps guidance for outdoor routes.
- Implemented obstacle detection with haptic feedback and spoken audio instructions.

InnovaTech AI – Private Document Assistant (RAG) | LangChain, FastAPI, ChromaDB, React, llama.cpp

- Built a secure RAG assistant that indexes company documents (PDF, DOCX, TXT, Markdown) locally and returns streamed, source-cited answers through a FastAPI backend and React web app.
- Designed privacy-aware model routing: admins choose Groq cloud models or a local GGUF model on llama.cpp, and questions touching confidential documents are answered only by the local model, with no cloud fallback.
- Added prompt-injection defences, signed expiring admin sessions with login throttling, and pytest and Vitest suites that run against fake models with no API calls.
- Structured the codebase with Factory, Repository, Facade and dependency-injection patterns.

ALPR System for Toll Gate Automation | YOLOv8, OpenCV, OCR, Python

- Built an end-to-end licence plate recognition pipeline for Sri Lankan vehicles at toll gates, using YOLOv8 for real-time plate detection and OCR to read plate numbers.
- Designed a modular architecture with separate detection, preprocessing, OCR and validation stages.

Skin Lesion Classifier | Python, Deep Learning, CNN

- Trained a custom CNN on 2,000+ dermoscopic images, reaching 90% accuracy and 0.95 ROC-AUC.
- Tuned the classification threshold to prioritise sensitivity to malignant lesions.

AI Research Content Agent | LangGraph, ChromaDB, React

- Developed a multi-agent RAG system with intelligent query routing that generates researched post content.
- Implemented corrective retrieval, structured agent workflows and reasoning loops for fact verification.

Industrial Automation Projects | Xinje XD3 PLC, Ladder Logic, Kinco HMI

- Designed ladder-logic control systems using timers, counters and VFD-based motor control.
- Wired and programmed a coffee machine, automatic door and vending machine, with operator interfaces built on Kinco HMI panels.

RFID Solenoid Smart Door Lock | ATmega328P, Embedded C

- Built an RFID access-control system with keypad authentication, solenoid lock actuation, LCD feedback and an admin management mode.

Additional: SpacePal – Android parking reservation app (Java, Android Studio) · ERP System for TB Industries – web-based ERP (PHP, JavaScript)

EXPERIENCE

Data Annotator (Computer Vision) — Surge Robotics (Idea8), Sri Lanka

- Annotated human body keypoints and sleeve, trouser and body landmarks for garment-measurement datasets used to train production computer vision models.
- Kept labelling consistent across large datasets to production annotation standards, improving data quality for downstream training and evaluation.
- Worked inside an industrial AI workflow serving government and commercial computer vision applications.

LEADERSHIP

Head of IT — Colombo Electronics & Robotics Club (CERC), University of Colombo

- Manage the club's technology infrastructure and lead the IT team.
- Run the IT side of the club's workshops and competitions, and coordinate technical activities for robotics and electronics events.

CERTIFICATIONS & LANGUAGES

- IBM – Build RAG Applications (Coursera)
- IBM – Develop Generative AI Applications (Coursera)

Languages: English (fluent), Sinhala (native)