Vithushan Edman Tusia Layas

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About Me

Computer Engineering undergraduate with a strong foundation in **Software Engineering** and hands-on experience building **full-stack, cloud-integrated applications**. Experienced in developing **backend services**, **RESTful APIs**, and **real-time systems**, with a focus on writing clean, scalable, and maintainable code.

Technologies

Programming Languages: Java, JavaScript, TypeScript, Python, C
Frameworks & Libraries: React.js, **Spring Boot**, React Native, Redux, TensorFlow, NumPy
Databases: MySQL, MongoDB
Cloud Platforms: AWS (EC2, IoT Core, RDS)
APIs & Architecture: REST APIs, WebSockets, GraphQL, Microservices
DevOps & Version Control: Git, GitHub, Docker
Development Tools: IntelliJ IDEA, VS Code, Postman

Education

University of Peradeniya, BScEngHons specializing in Computer Engineering — Feb 2022 – Present

- **GPA:** 3.705/4.0
- **Coursework:** DSA, Advanced Database Systems, Applied Software Architecture, Operating Systems, Computer Architecture

Jaffna Central College, Secondary Education — Jan 2007 – Oct 2020

- **G.C.E A/L 2020:** 2AB
- **Island rank:** 881

Projects

Green Tech: Greenhouse Automation | Group — Nov 2024 – Jul 2025

- Led a team in developing an **IoT-based autonomous greenhouse system** with web and mobile applications for **real-time monitoring and automated control** of environmental parameters, enabling optimized crop growth and improved resource efficiency.
- **Project Contributions:**
  - **Backend / Cloud:** Architected a **Spring Boot RESTful API** integrated with **AWS IoT Core** using the **MQTT protocol** for bidirectional device communication; implemented **JWT-based role-based authentication** and **real-time data streaming** using **WebSocket**.
  - **Mobile Application:** Developed a cross-platform **React Native** application (iOS/Android) supporting **device registration, user management**, and **real-time data visualization** via WebSocket, along with auxiliary support pages.
  - **Hardware:** Designed and prototyped an **ESP32-based embedded system** with automatic creation and management of **AWS IoT Core topics**.
- Supported **scalable deployment for smart agriculture use cases** by deploying frontend and backend services and validating **real-time data streaming across concurrently connected IoT devices**.
- **Tools & Technologies: Spring Boot**, **React Native**, **React.js**, **MySQL**, **JWT**, Git, **AWS (IoT Core, EC2, RDS)**, ESP32, C++

MIS for Non-Academic Establishment Division | Group — Apr 2024 – Nov 2024

- Led a team in designing and developing a full-stack **Leave Management System** for **non-academic staff at the University of Peradeniya**, improving efficiency and transparency in leave application and approval workflows.

- **Project Contributions:**
  - Implemented **dynamic leave form generation and configurable multi-level approval workflows**, enabling administrators to modify approval logic without code changes.
  - Developed separate, **role-based dashboards** for administrators and staff to monitor leave balances, application statuses, and approvals.
  - Integrated modules for **staff registration, internal announcements, and discussion forums** to enhance organizational communication.
  - Ensured **secure authentication and session management** using **JWT**.
- **Tools & Technologies: ReactJS**, **Spring Boot**, **MySQL**, **JWT**, Git, GitHub

Sign-Language Recognition Platform | Group

Dec 2024 – Feb 2025

- Developed a **real-time sign language recognition system** capable of identifying both **static and dynamic hand gestures** using machine learning and deep learning techniques.
- **Project Contributions:**
  - **Designed and implemented the dynamic gesture recognition module** using an **LSTM-based architecture** trained on **60-frame video sequences** to capture temporal hand movements.
  - Contributed to **custom dataset collection and preprocessing** using OpenCV and supported model training and evaluation with TensorFlow and NumPy.
  - Integrated the trained models into an **interactive web-based platform** for live gesture recognition using ReactJS for the frontend and Flask for backend inference.
- **Tools & Technologies: ReactJS**, **Flask**, **Git**, TensorFlow, NumPy, OpenCV, LSTM, GitHub

Research

A Hierarchical Hybrid Framework for Intrusion Detection in Network and Application Layers | Group

Nov 2025 – Present

- Developing a **hierarchical hybrid intrusion detection system (IDS)** to identify **zero-day and unknown attacks** across **network and application layers** using **parallel processing**, addressing limitations of sequential-layer detection models.
- **Designing and implementing a core hierarchical hybrid architecture** that leverages **unsupervised anomaly detection** for real-time identification of unusual network behavior and **supervised classification models** to accurately label detected anomalies.
- **Building a fusion layer as a meta-learner** to intelligently combine outputs from network- and application-layer models, improving consistency and overall detection reliability.
- Integrating a **semi-supervised active learning mechanism** that **automatically pseudo-labels detected anomalies and incrementally retrains models**, enabling continuous adaptation to evolving cyber threats.
- **Tools & Technologies: Python**, TensorFlow, PyTorch, scikit-learn, Pandas, NumPy, Wireshark, Git

Certifications and Activities

Certifications

- **AWS Cloud Technical Essentials** — AWS — Link | [Jan 2026]
- **Introduction to Containers w/ Docker, Kubernetes OpenShift** — IBM — Link | [Feb 2026]
- **Introduction to Cloud Computing** — IBM — Link | [Sept 2024]

Professional Roles

- **Committee member** — Aces [2025 – present]

Referees

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