

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 scalability and reliability.

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

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

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

Professional Roles

- **Committee member** – Aces

2025 – present

Certifications

- AWS Cloud Technical Essentials – AWS 
- Introduction to Containers w/ Docker, Kubernetes OpenShift – IBM 
- Introduction to Cloud Computing – IBM 
- Web Development – University of Moratuwa

Referees

Prof. Roshan G. Ragel
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