Lasitha Amarasinghe

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Interests

Deep Learning, Computer Vision, Data Engineering, Software Engineering

Professional Experience

Research Engineer Intern - National University of Singapore (QS Rank - 8) Dec 2024 - May 2025

Supervisor: Prof. David Hsu - Director, Smart Systems Institute, NUS Intern Certificate

- Contributed to TOM project, a digital assistant platform for Augmented Reality glasses.
- Implemented AiGet service to allow context-aware engagement by processing real-time data streams.
- Optimized a low-latency Unity client - Python server architecture using WebSockets and Protobufs.
- Implemented multimodal interaction pipeline fusing voice, vision, gaze inputs to enhance user intent recognition.
- Actively participated in code reviews and writing unit tests to minimize deployment bugs.

Undergraduate Teaching Assistant - University of Moratuwa Sep 2025 - Dec 2025

- Mentored 100+ undergraduates during lab sessions for Internet of Things & Laboratory Practice modules

Education

University of Moratuwa, Sri Lanka Mar 2022 - Present

B.Sc. Eng.(Hons.) in Electronic & Telecommunication Engineering | **CGPA**: 3.86/4.00 Transcript
Minor in Mathematics | Dean's List - Semesters 1,2,4,5,6
Coursework: Pattern Recognition, Image Processing & Machine Vision, Deep Learning for Vision, Software Design Competition, Data Structures & Algorithms, Linear Algebra, Calculus, Applied Statistics

Dharmaraja College, Kandy, Sri Lanka Jan 2012 - Dec 2020

G.C.E. A/L , AAA , Z-Score: 2.5972 , Island Rank: 100/35000 (Top 0.3%) Transcript

Skills

Programming Languages	Python, Java, C, C++, MATLAB
AI/ML & GenAI	TensorFlow, PyTorch, Keras, Scikit-learn, Hugging Face, RAG, AI Agents
Full Stack Development	React.js, Spring Boot, HTML, CSS, JavaScript, FastAPI
Databases & Tools	PostgreSQL, Git, Docker, Postman, Linux, Unity, AWS EC2, MLflow

Projects

NeoCare - Contactless Neonatal Health Monitoring System (FYP, Ongoing) Link

- Developed a contactless neonatal health monitoring system using Remote Photoplethysmography (rPPG) to predict heart rate, SpO2, and jaundice levels of neonates by physiological signal extraction.
- Benchmarked 3D-CNN, Vision Transformer, Mamba architecturess to identify the optimal model.
- Achieved SOTA performance in contactless neonatal HR prediction with a MAE of 2.79 on NBHR dataset.
- Optimized model inference for mobile phones to ensure low latency performance and patient data privacy.
- Collaborated with De Soysa Hospital to curate a neonatal facial video dataset for clinical benchmarking.

Transformer Inspection System (Team) Link

- Designed RESTful APIs and architected a full-stack transformer inspection platform using Java Spring Boot, React.js, and PostgreSQL, streamlining the digitization of transformer maintenance records
- Engineered an automated anomaly detection pipeline using U-Net segmentation combined with thresholding to precisely identify and isolate thermal defects.

UAV-Detection, Tracking & Payload Identification System (Team) Link

• Engineered a real-time drone detection and tracking system using multimodal RGB-IR fusion, achieving over 90% tracking persistence and over 99% F1-score for payload classification under low light, fog, occlusion conditions.
• Implemented a Y-shape Dynamic Transformer (YDTR) to fuse thermal and visual data streams, integrating YOLOv8 and BoT-SORT to maintain robust detection and tracking.

Flower Exchange - High Performance Trading Engine (Team) Link

• Engineered a high-performance trading exchange in C++ using OOP principles and Unit Testing, implementing a central limit order book to handle real-time order matching, validation, and partial execution logic.

Multi-Scale ConvNeXt Architecture (Team) Link

• Enhanced the ConvNeXt architecture by designing a Multi-Scale Depthwise Convolution module, replacing standard static kernels with dynamic multi-branch feature extraction.
• Engineered a triple-path processing block that splits channels into local (3x3), standard (7x7), and global (dilated) streams, capturing diverse receptive fields (up to 19x19) simultaneously.

Hybrid Agentic RAG Assistant (Individual) Link

• Engineered a hybrid RAG architecture using LangChain and ChromaDB, decoupling local HuggingFace embeddings from Groq (Llama 3.1) inference to achieve 10x faster generation speeds with zero API costs.
• Implemented an agentic router that dynamically switches between DuckDuckGo web search and local context (processed via RecursiveCharacter chunking), enforcing strict source verification.

Colombo Stock Exchange Smart Scout: Agentic Financial Analyst (Individual) Link

• Engineered a stateful autonomous agent using LangGraph and Llama-3.3-70b deployed on Groq LPUs, achieving real-time technical analysis with 300 tokens/sec inference speeds.
• Solved the CSE data accessibility gap by implementing a cyclic ReAct workflow with Tavily Search, enabling the agent to autonomously fetch live market data and eliminate hallucinations.

Achievements

- **IEEEXtreme 19.0:** *Sri Lanka Rank 4, World Rank 76, 8500+ teams, 24 hours* - IEEE
- **IEEEXtreme 18.0:** *Sri Lanka Rank 8, World Rank 129, 8500+ teams, 24 hours* - IEEE
- **Techno Xtreme 2023:** *Champions, 250+ teams* - IESL Student Chapter, University of Moratuwa
- **CYPHER:** *Champions, 200+ teams* - IEEE WIE Student Branch, Kothalawala Defence University
- **SLIoT Challenge:** *4th place, 100+ teams* - Computer Science Engineering, University of Moratuwa
- **ENIGMA 2024:** *5th place, 250+ teams* - Mathematics Society, University of Moratuwa

Leadership

Vice President - Spark Branch - Electronic Club of University of Moratuwa Link

• Spearheaded operations to drive technical innovation and professional development for undergraduates.
• Organized Spark Challenge, achieving Sri Lanka's record-highest prize pool for a university competition.

Department Representative - Electronic and Telecommunication Engineering Link

• Coordinated the planning and logistics for 10+ major events, including EXMO'23 and SLRC.
• Bridged communication between faculty and students to align academic initiatives.

Referees

Dr. Sampath K. Perera
B.Sc.Eng.(Moratuwa), M.Sc.(Western), Ph.D.(RUB)
Senior Lecturer, ENTC, Univeristy of Moratuwa
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Mr. Koh Chun Keat
Head of Engineering, Smart Systems Institute,
National University of Singapore, Singapore
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