



Eshan Jayasundara

AI/ML Engineer

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Profile

AI/ML Engineer specializing in Natural Language Processing and Large Language Models, with hands-on experience building and deploying production-grade ML pipelines. Skilled in handling imbalanced datasets in classical machine learning settings, designing robust evaluation strategies, and improving model interpretability using SHAP. Strong foundation in PyTorch, TensorFlow, and MLOps, focused on delivering scalable and reliable AI solutions.

Education

BScEngHons specializing in Computer Engineering

2021 - 2025

Faculty of Engineering, University of Peradeniya | GPA: 3.65 out of 4.00

GCE Advanced Level Examination - Physical Science Stream

2019

Central College Kuliapitiya | Z Score: 2.1645 | District Rank: 40

Experience

Trainee Machine Learning Engineer - IronOne Technologies LLC | 🌐

July 2024 - January 2025

Applied advanced ML techniques to forecast customer credit scores 12 months ahead for real-world finance use case. Tackled data imbalance and enhanced model interpretability to support actionable business decisions.

- Enhanced model explainability using SHAP to improve stakeholder trust and regulatory compliance.
- Specialized in handling imbalanced datasets through advanced experimentation.
- Designed custom loss functions to boost model performance on minority classes.
- Translated complex ML outputs into intuitive domain-specific visualizations for client presentations.
- Improved recall for delinquent customers from 0.39 to 0.47, while maintaining recall of non-delinquent customers at 0.98 with rigorous research and experimentation.

AI/ML Developer - Fonix EDU (PVT) LTD | 🌐

September 2024 - Present

Involved in building AI-powered educational platform (beta.eduone.lk) with custom OCR and LLM-assisted grading for Sinhala language.

- Customized TrOCR model for Sinhala by adapting tokenizer and training on custom dataset; passed PoC testing.
- Integrated Google Gemini API for AI-assisted exam grading workflow within LMS/IMS platform.
- Developed benchmark to evaluate LLM hallucination rates in handwriting recognition tasks.

Projects

AI Software Engineer for GitHub Issue Resolution | Final Year Project | 🌐

Developing novel graph-based approach to localize erroneous files in large code repositories using Chain-of-Thought reasoning and AI agents for automated code editing. Open-source, cost-effective solution targeting competitive performance on SWE-Bench.

Key Contributions:

- Built embedding-based retriever using ChromaDB and OpenAI embeddings for file localization.

- Implemented LangChain workflows with reasoning-based prompting for suspicious file identification.
- Deployed SWE-bench evaluation API on Google Cloud with Django, implementing CI/CD pipeline.

AI Agent for Code Editing Tasks | Individual |

Autonomous coding agent using Google Gemini with function calling to identify and fix Python code bugs through agentic loop.

Key Features:

- Implemented context window memory tracking full conversation history across iterations.
- Built some tools with function declarations: file reader, file info, Python executor, and file writer, etc.
- Agent iteratively analyzes code, calls functions with LLM-generated arguments, appends outputs to history.

SLM for Sinhala (SinQWEN) | Individual Research |

First foundational 3B-parameter SLM for Sinhala via Full-Parameter Continual Pre-training on Qwen-3B using a large corpus.

Key Achievements:

- Custom WordPiece tokenizer (32K vocab) with ZWJ preservation for accurate Sinhala cluster rendering.
- Edge-ready deployment (4-8GB VRAM) with quantization.

Simple Transformer Implementation | Individual |

Single-head Transformer from scratch using PyTorch based on "Attention Is All You Need" research. Trained with teacher forcing.

Architecture:

- Encoder: Self-attention, positional encoding, feed-forward, residual connections.
- Decoder: Masked self-attention, cross-attention, autoregressive generation.

Sleep Apnea Detection Using Pulse Oximetry | Academic |

Deep learning approach for sleep apnea screening using SpO_2 -only signals from NSRR datasets, eliminating need for full polysomnography.

Key Contributions:

- Developed sleepdataspo2 Python package for multithreaded EDF download, preprocessing, and feature extraction.
- Implemented signal cleaning: removed artifacts, median filtering, 1Hz downsampling.
- Compared ODI (baseline), OBM (digital biomarkers), and embedding-based deep learning models.

Hand Tremor Biometric Recognition | Academic |

Cost-effective ML solution for hand tremor based biometric recognition system using 3 MPU9250 sensors positioned on wrist, mid-forearm, and upper arm.

My Contribution:

- Developed MLP classifier from scratch using basic Python libraries to classify tremor vs stable hand.
- Applied k-fold cross-validation for model generalization and compared with other ML algorithms.

Technical Skills

- **Programming Languages:** Python, TypeScript
- **ML/DL:** PyTorch, TensorFlow, scikit-learn, XGBoost, PEFT, Custom Loss Functions
- **LLM/NLP:** Google GenAI, LangChain, LangSmith, LangFuse, OpenAI API, ChromaDB, Qdrant
- **Data:** NumPy, Pandas, Matplotlib, Seaborn, imbalanced-learn, SHAP

- **MLOps:** MLflow, GCP, Docker, CI/CD (GitHub Actions)
- **Backend Frameworks:** Nest.js, FastAPI | **Databases:** MySQL, PostgreSQL

Certifications

Coursera

- Deeplearning Specialization
- Google AI Essentials

[Link](#)

DataCamp

- Supervised Learning with scikit-learn
- Object-Oriented Programming in Python

[Link](#)

Achievements

- Island Rank 77 in IEEEXtreme 18.0 (2024) as Team BitBoss
- Top 30 in ACES Coders v11.0 (2024) as Team Whitehats
- 3rd Place - IEEE Innovation Nation Sri Lanka Central Province Competition

[Certificate](#)

Volunteering

Casual Instructor (Undergraduate Teaching Assistant)

University of Peradeniya

Lab instructor for Computing (Python), Digital Design, Data Structures & Algorithms, and Machine Learning courses.

IEEE Computer Society

Term 24/25

Secretary

IEEE Robotics and Automation Society

Term 23/24

Web Master

Association of Computer Engineering Students (ACES)

Term 23/24

Committee Member

Department Project ESCAL website development

Contributed to continuous development of the Embedded Systems and Computer Architecture Laboratory website.

IEEEXtreme 17.0

Organizing Committee Member

Referees

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