

Oshan Mudannayake

ML Engineer / Data Scientist

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Lead ML engineer and published researcher with 6+ years of experience building production LLM and machine-learning systems. Experienced across model development, backend architecture, MLOps, and experimentation, with research in reinforcement learning and computer vision.

PROFESSIONAL EXPERIENCE

Aug 2023 – Present	Lead ML Engineer / ParadigmAI
Colombo 3 yrs 1 mo	› Built an LLM-backed platform that predicts a respondent’s survey answers from their prior response history. FastAPI · Python · React · TypeScript · LangChain · OpenAI · AWS › Designed the translation backend for a low-code system compiling graph-structured workflows into executable code. Python · LlamaIndex · OpenAI · Anthropic › Engineered a multi-transport LLM gateway (REST/gRPC) with key rotation, vendor fallback (OpenAI/Anthropic), and request-level tracing, serving production traffic peaking at 500K requests/day. NestJS · TypeScript · PostgreSQL · gRPC · OpenAI · Anthropic › Built LLMOps tooling: an async Celery/SQS evaluation service and a Streamlit analytics suite surfacing cost, latency, and health metrics across LLM workloads. Streamlit · Python · Celery · AWS SQS · SQLAlchemy › Architected an AI-powered code evaluation platform ingesting GitHub repositories for automated review. FastAPI · Python · Celery · OpenAI Codex · CloudFormation · LocalStack
Nov 2021 – Aug 2023	Senior Data Science Engineer / WSO2
Colombo 1 yr 10 mos	› Trained and deployed classification, regression, and clustering models driving product adoption and user-engagement metrics. › Built internal analytics dashboards exposing model performance, A/B test outcomes, and business KPIs. › Standardized team practice for experiment tracking, model versioning, and reproducible evaluation pipelines.
Apr 2021 – Oct 2021	Data Science Engineer / WSO2
Colombo 7 mos	› Analyzed product-usage telemetry and built predictive models to surface adoption trends; scoped ML opportunities with product and engineering stakeholders.
Mar 2020 – Mar 2021	Software Engineer - IAM Team / WSO2
Colombo 1 yr 1 mo	› Shipped features into WSO2 Identity Server on the product-development track and served on the patch-services team triaging and backporting fixes across supported customer releases.
May 2018 – Aug 2018	Student Developer / CERN-HSF - Google Summer of Code
Remote 4 mos	› Contributed to Phoenix, the next-gen Vue.js web UI for ownCloud and CERNBox (CERN’s cloud-storage platform serving 13K+ users over 2.5 PB), with offline-capable browser operation via service-worker caching and a Go-based local WebDAV bridge. Vue.js · TypeScript · Service Workers · Go · WebDAV

RESEARCH EXPERIENCE

Aug 2026 – Present	Visiting Researcher / KIXLAB (KAIST Interaction Lab)
Remote 1 mo	› Conducting research with KIXLAB, the human-computer interaction lab at KAIST.
Mar 2023 – Apr 2024	Community Researcher / Cohere For AI
Remote 1 yr 2 mos	› Built the web platform used to collect multilingual human annotations for the Aya instruction-tuning dataset (ACL 2024) — SSO, annotation workflow, analytics, RTL support. Next.js · NestJS · PostgreSQL · GCP
May 2021 – Dec 2024	Research Assistant / University of Colombo School of Computing
Colombo 3 yrs 8 mos	› Applied classical and deep time-series models to forecast long-horizon municipal solid-waste generation in Sri Lankan cities; published in IEEE Access.
Jul 2018 – Jan 2019	Research Intern / University of Colombo School of Computing
Colombo 7 mos	› Prototyped a privacy-preserving training layer over TensorFlow enabling model fitting on homomorphically encrypted tensors across a distributed worker network.

PROJECTS

ATLAS-RL — RL Thesis Line

Reinforcement Learning · JAX · Crafter · Craftax · DDQN · WandB · Python

Seven-experiment MSc thesis line on RL agents — prescribed and emergent foveation, sensory curricula on pixel DDQN, GA-optimized intrinsic rewards, joint reward-sensory coevolution, and a paired-offset diagnostic for selection-bias-resistant hyperparameter reevaluation.

Deepfake Detection in South Asia

Deepfake Detection · Machine Learning · Computer Vision · HCI

Researching deepfake detection for South Asian contexts with Dr. Dilrukshi Gamage.

UAV Water Surface Detection

UNet · TensorFlow · OpenCV · Python
UNet-based semantic segmentation for water-surface detection in low-altitude UAV imagery; published in JVCI (Elsevier).

Municipal Waste Forecasting

Time-series · Darts · LSTM · N-BEATS · Python
Multi-step time-series forecasting benchmarking classical ML against deep sequence models (LSTM, N-BEATS, TCN); published in IEEE Access.

kMatrix — Streaming Graph Summarization

Streaming Graphs · Sketching · Python
A space-efficient sketch for streaming graph summarization supporting real-time structural property queries over unbounded edge streams; published at IEEE ICIAfS; BSc thesis (Grade A).

ImageLab

Python · OpenCV · Image Processing · GUI
An interactive tool for exploring image processing pipelines, aimed at both novices and experts.

Machine Learning over Encrypted Data

ML · Encryption · TensorFlow · Python · GCP
Developed a privacy-preserving layer over TensorFlow to enable ML training on encrypted data across distributed machines.

TesSTA

React · TypeScript · Java · Spring Boot · Hibernate · Tesseract · AWS
An OCR Solution for Sinhala language using Tesseract OCR Engine.

Machine Learning based Internet Domain Entity Matching and its Applications

ML · Scikit-Learn · TensorFlow · Python
Exploratory research on malicious-domain detection using machine learning; the project was discontinued.

SKILLS

languages = Python · TypeScript · Java · SQL · C · C++ · Rust · R

llm / genai = LangChain · LangGraph · LLamaIndex · RAG

ml / dl = PyTorch · JAX · TensorFlow · Scikit-learn · OpenCV

rl = Gymnasium · Craftax · WandB

web / backend = React · Next.js · NestJS · FastAPI · Astro · Spring Boot · SQLAlchemy · Pydantic

mlops = Docker · Kubernetes · MLflow · Celery · gRPC

iac = Terraform · CloudFormation

data = Pandas · NumPy · Darts · Jupyter

databases = PostgreSQL · MongoDB · Redis · Firebase · SQLite

vector dbs = Pinecone · Chroma · pgvector · Weaviate

cloud = AWS (Lambda · ECS · S3 · SQS · SageMaker · CloudWatch · IAM · Cognito) · GCP (Cloud Run · Cloud Build · BigQuery)

visualization = Matplotlib · Seaborn · Streamlit

EDUCATION

2023 – 2026 (expected)
MSc in Data Science & AI
University of Moratuwa
GPA: 4.02/4.2
Thesis advisor: Dr. Thanuja D. Ambegoda

2016 – 2020
BSc(Hons) in Computer Science
University of Colombo School of Computing
GPA: 3.61/4.0 (Rank: 6th of 156 students)

PUBLICATIONS

2026 **Affordable Winner's-Curse Correction for Single-GPU Hyperparameter Search**
GlobalSouthAI @ IJCAI-ECAI 2026

2025 **Privacy-Preserving ML via Secure Multi-Party Computing: Techniques and Trends**
Computers, Materials & Continua

2024 **ImageLab: Simplifying Image Processing Exploration**
Preprint

2024 **Aya: Open-Access Multilingual Instruction-Tuning Dataset**
ACL 2024

2023 **Detecting Water in UAV Image Streams with Flight Constraints**
JVCI (Elsevier)

2022 **ML and Deep Learning for Multi-Step Municipal Waste Forecasting**
IEEE Access

2021 **kMatrix: Space-Efficient Streaming Graph Summarization**
IEEE ICIAfS

ACHIEVEMENTS

2019 HackZurich, Switzerland (Got selected out of 5000+ hackers)

2018 Google Summer of Code 2018 (CERN-HSF)

2018 Hack The North, Waterloo, Canada

2018 Codezilla (1st place)

2018 LetMeHack (1st place)

2017 Persistent Hackathon (2nd place)

2016 IEEE preXtreme 1.0 (1st place)

OPEN SOURCE

WSO2 Identity Server
Java · OSGi · REST
Designed and shipped the tenant-aware CORS architecture for Identity Server 5.11 end-to-end — OSGi management service, DAO, REST APIs, servlet valve, and public migration guide.

SCoRe Lab / C2SI

Python · React · TensorFlow · GitHub Actions
Long-running contributor and Google Summer of Code mentor; initiated and architected three flagship projects (ImageLab, TensorMap, DataLoom) and built release-engineering automation.