Oluwatimilehin (Timi) Emmanuel Owolabi

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Education

Covenant University — Ogun, Nigeria
Bachelor of Engineering in Electrical & Electronics Engineering, **GPA:** 4.85/5.0 — Sep 2020 – Aug 2025
- **Thesis:** Coordinated Control of Quadrotor Swarms: Classical, Adaptive, and Learning-Based Methods

Research Experience

ML Collective — Lagos, Nigeria (Remote)
Embodied AI Research Group Lead — Jun 2026 – Present
- Investigating parameter-efficient optimizations of NVIDIA Cosmos Policy for low-latency robot manipulation, evaluating accuracy-efficiency trade-offs on LIBERO and RoboCasa.
- Implemented layer skipping on NVIDIA's Cosmos3-Edge-DROID model to reduce inference latency in developing a compact world-action model.

WaySense — Dr. Daniel Omeiza, Oxford Robotics Institute — Oxford, United Kingdom (Remote)
Undergraduate Research Assistant — Mar 2024 – Sep 2024
- Analyzed the Lyft Level 5 dataset to estimate multi-agent vehicle positions and velocities, detect lane-change maneuvers, and improve explainability of autonomous driving decisions using ego- and agent-centric representations.
- Pioneered adaptation of the fast subset-scan algorithm on Graph Neural Networks to identify statistically significant anomalies in traffic datasets.

Google Developer Groups on Campus — Ogun, Nigeria
Robotics Research Team Lead — Sep 2024 – Aug 2025
- Led replication of Stanford's ALOHA bimanual robotic manipulation paper in simulation.
- Developed vision-based manipulation policies for box-picking and object interaction tasks using MuJoCo and JAX.
- Prototyped a low-cost 3D-printed robot arm for object sorting, matching WidowX 250 S performance at 2.5% of its cost.

Publications & Manuscripts

T. E. Somefun, **T. Owolabi**, and O. M. Longe, "Practical Trade-offs in Neural Network Optimization: Brute Force Search and Gradient Descent", *Engineering Research Express*, 2025.

A. Awelewa, K. Ojo, T. Abimbola-Oladejo, **T. Owolabi**, "Fuzzy-PID Controller for Liquid Level Control of Tank Systems", *NIPES-Journal of Science and Technology*, 2025.

T. E. Somefun et al. and **T. Owolabi**, "Energy Optimization Algorithm for Reducing Energy Consumption in a Smart Home", *IEEE ICMEAS*, 2023.

O. Idowu et al. and **T. Owolabi**, "Enhancing Radiological Imaging for Better Healthcare Outcomes Through High Performance Hybrid Approach", *ASRIC Journal on Engineering Sciences*, 2024.

O. Owolabi, C. Chukwuma, O. Omogboyega, and A. Awelewa, "Coordinated Control of Quadrotor Swarms: Classical, Adaptive, and Learning-Based Methods", *Under Review, IJCAI*, 2026.

A. Awelewa, K. Ojo, E. Edmond, **O. Owolabi**, and I. Samuel, "Smart Energy Metering and Monitoring System Using Internet of Things", *Under Review, IEEE SAUPEC*, 2026.

Selected Projects

SmolWAM | Python, LIBERO, RoboCasa — Ongoing
- Developing SmolWAM, a compact world-action model based on NVIDIA Cosmos3 Policy for fast edge device inference.
- Benchmarking manipulation performance and inference efficiency across LIBERO and RoboCasa.

Autonomous Quadcopter | C++, ESP32, PlatformIO — 2025
- Implemented an ESP32 flight-controller with modular drivers for sensors, receiver input, state estimation, PID control, motor actuation, battery monitoring, EEPROM, and telemetry.
- Built cascaded attitude/rate PID control, 50 Hz 16-bit ESC PWM motor mixing, GPS/barometer/IMU/compass sensor fusion, PPM receiver decoding, and a ground-station UI.

Coordinated Control of Multi Quadrotor Swarms | Python, PyTorch, JAX, PyBullet — 2025
- Modeled quadrotor dynamics in quaternion and Euler state-space form, then implemented PID, LQR with integral action, MRAC, PPO, and MPC controllers for position and trajectory tracking.
- Developed minimum-snap trajectory planning and multi-agent formation controllers using leader-follower, consensus, behavioral rules, and potential-field collision avoidance in gym-pybullet-drones.

Pick-and-Place Robot Arm | Python, JAX, MuJoCo, Gymnasium, Stable-Baselines3 2025

- Built custom Gymnasium environments around a MuJoCo Franka Panda scene, exposing actuator control ranges and observations from qpos, qvel, cube pose, end-effector pose, and finger poses.
- Trained staged PPO policies for reaching, grasping, and lifting with reward shaping for distance, grasp quality, contact-based grasp detection, cube height, drop penalties, randomized resets, and success-rate evaluation.

Technical Skills

Languages: Python, C++, SQL, Rust, Java
ML & Robotics: PyTorch, TensorFlow, JAX, Hugging Face, MLflow, FastAPI, LangChain, ROS2, MuJoCo, CasADi
DevOps & Cloud: Docker, Kubernetes, AWS, GCP, Terraform, GitHub Actions, Argo CD, Grafana, OpenTelemetry

Professional Experience

Quidax Technologies Lagos, Nigeria (Remote)
Platform & AI Engineer (Graduate Trainee) Jan 2026 – Present

- Optimized AWS EKS autoscaling with Karpenter, increasing CPU utilization from 20% to 50% and memory utilization from 30% to 70%, reducing infrastructure costs by 8% while maintaining reliability.
- Led the engineering track of QuidaxOS, an AI agent that supports Engineering, Product, and Design teams from product discovery to deployment, reducing handoff friction and aligning execution with company objectives.

Trotta Technologies, Inc San Francisco, California (Remote)
Founding Machine Learning Engineer Jan 2026 – Feb 2026

- Founding engineer and ML team lead on a short-term contract, building the company's AI infrastructure on Google Cloud Vertex AI and shipping a production multi-agent defense system for phishing, deepfake audio, and synthetic video detection.
- Developed a self-improving AI threat detection system using LangSmith-hosted agents and anomaly detection neural networks on Google Cloud Run, reducing malicious email and phone call verification time from about 1 hour to 20 seconds.

Scrella Technologies Lagos, Nigeria
Lead Machine Learning Engineer Jul 2024 – Dec 2024

- Led a three-person ML team and built the company's AI infrastructure on AWS SageMaker, architecting the full MLOps lifecycle from data collection through production deployment.
- Developed an AI-powered phone inspection pipeline using fine-tuned YOLOv11, CLAHE, spectral analysis, and Google PaliGemma to detect device imperfections from user videos, eliminating manual approval and reducing onboarding time from 5 minutes to 18 seconds.

Awards and Honors

First Class Honours, Dept. of Electrical and Information Engineering, Covenant University 2025
Finalist, Pan-African Robotics Competition 2024
Founder's Award, Best WASSCE Result, Wellspring College 2021
Valedictorian, Department of Science, Wellspring College 2020

Selected Talks

AI: Our Current Reality and Future Trajectory Nigerian Society of Engineers, August 2024
Deep Learning: Neural Networks APWEN, April 2024

Teaching, Leadership & Community Impact

Engineering Innovation Empowerment Foundation (EIEF) Abuja, Nigeria
Co-Founder Dec 2024 – Present

- Launched The Classroom Project to provide tutoring, mentoring, and learning materials for low-resource public secondary schools.

Association of Electrical and Information Engineering Students Ogun, Nigeria
President Sep 2024 – Aug 2025

- Led a 20-member executive team in coordinating projects and competitions for over 2,000 students.
- Launched a student mentorship program pairing juniors with seniors for academic and career guidance.

Association of Professional Women Engineers of Nigeria Lagos, Nigeria
Machine Learning Tutor Aug 2023 – Oct 2023

- Taught foundational machine learning concepts, including supervised learning, model evaluation, and neural networks, to over 50 female engineering students.

Project Cage Technologies Lagos, Nigeria
Robotics Instructor Aug 2023 – Oct 2023

- Mentored students through hands-on robotics projects, guiding system design, hardware integration, and programming.