Oluwatimilehin (Timi) Owolabi

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Education

Covenant University (Ranked 1st in Nigeria) — Ogun, Nigeria
B.Eng. Electrical & Electronics Engineering | **GPA: 4.85/5.0** | **Top 2% in Department** — Sep 2020 – Aug 2025
Thesis: Coordinated Control of Quadrotor Swarms: Classical, Adaptive, and Learning-Based Methods

Research Interests

Robot Learning & Control, Efficient & Safe Physical AI Models, Reinforcement Learning, Autonomous Driving.

Publications

T. Owolabi, H. Olawore, F. Adelakun, and A. Oyewumi, "SmolWAM: A Latent World-Action Model for Robotic Manipulation on Edge Devices", *NeurIPS 2026 Workshop on Robot Learning with World Models: Capabilities, Frontiers, and Challenges*; *CoRL 2026 Workshop on The Action Gap: Large Generative Models Learn Rich Knowledge*; and *CoRL 2026 Workshop on Do Robots Need World Models?*, 2026.

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.

O. Idowu, H. Hu, A. Akinwale, A. Ilori, Z. Xingze, Y. Wang, A. Rasheed, and **T. Owolabi**, "Enhancing Radiological Imaging for Better Healthcare Outcomes Through High Performance Hybrid Approach", *ASRIC Journal on Engineering Sciences*, 2024.

T. E. Somefun, N. Elijah, A. E. Igho-Orere, **T. Owolabi**, C. Somefun, and S. Ongbali, "Energy Optimization Algorithm for Reducing Energy Consumption in a Smart Home", *IEEE ICMEAS*, 2023.

Research Experience

ML Collective — Global (Remote)
Embodied AI Research Group Lead — Jun 2026 – Present

- Led a four-author research collaboration, formulating hypotheses, designing experiments, and investigating which components of pretrained video world models are necessary for robot control.
- Developed SmolWAM, a 0.88B-parameter world-action model distilled from NVIDIA's Cosmos Policy, using single-frame visual latents, cached language features, 12 of 28 transformer blocks, and one-step action and future-latent prediction.
- Achieved 95.5% success across 400 LIBERO episodes after 3.6 GPU-hours of training, with 11× faster inference (624 to 57 ms), 18.5× fewer FLOPs, and 3.2× lower peak GPU memory.

WaySense — Dr. Daniel Omeiza, Oxford Robotics Institute — Oxford, United Kingdom (Remote)
Research Assistant — Mar 2024 – Sep 2024

- Pioneered the adaptation of the Fast Generalized Subset Scan algorithm to Graph Neural Networks and graph-convolutions, deriving empirical p-values and tail tests to detect anomalous vehicle groups and interpret autonomous-driving decisions.
- Modeled autonomous-driving scenes from the Lyft Level 5 dataset as vehicle-interaction graphs, analyzing agent positions, velocities, and lane-change behaviors to improve decision explainability.

Selected Projects

Muta | Python, C++, Hugging Face, llama.cpp — 2026

- Built an offline, personalized AI tutor for CPU-only laptops, optimizing local LLM inference through quantization-aware training and pruning. Used by 200 students and won 3rd place ($5000) in the 2026 Africa Deep Tech Challenge.

Autonomous Quadcopter | C++, ESP32, PlatformIO — 2025

- Developed an ESP32 flight controller with cascaded attitude/rate PID control, GPS/barometer/IMU/compass sensor fusion, PPM receiver decoding, 50 Hz ESC PWM motor mixing, battery monitoring, and ground-station telemetry.

Coordinated Control of Multi Quadrotor Swarms | Python, PyTorch, JAX, PyBullet — 2025

- Modeled quadrotor dynamics and implemented PID, LQR, MRAC, PPO, and MPC controllers for trajectory tracking, alongside minimum-snap trajectory planning and multi-agent formation control using leader-follower, consensus, behavioral, and potential-field methods.

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

- Developed custom MuJoCo/Gymnasium environments for a Franka Panda robot and trained staged PPO policies for reaching, grasping, and lifting using curriculum learning, reward shaping, contact-based grasp detection, and success-rate evaluation.

Affordable 3D-Printed Manipulator | C++, Python, 3D Printing — 2025

- Designed and built a low-cost 3D-printed robotic manipulator with five articulated joints and a gripper, implementing inverse

kinematics, servo-based joint control, smooth motion interpolation, joint limits, and Python serial communication.

Professional Experience

Quidax Technologies Lagos, Nigeria
Platform 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.
- Modernized legacy manual Kargo deployment workflows by migrating Node, Python, Go, and Java services to reusable GitHub Actions and Argo CD pipelines, helping achieve 98% automated deployment/failover coverage across 1,099 jobs.
- 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 under 20 seconds while enabling continuous self-supervised model retraining from production signals.

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.
- Designed and deployed 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 review time from 5 minutes to 18 seconds.

Schneider Electric Lagos, Nigeria
Sustainability Intern Aug 2023 – Oct 2023

- Conducted robotics workshops for young students on building a self-driving car.
- Partnered with NGOs to deliver STEM tutoring aligned with Schneider Electric's global initiative to empower 1 million youths.

Awards and Honors

2nd Runner Up, Africa Deep Tech Challenge ($5,000) 2026
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 Presentations & Talks

Poster Presentation: **SmolWAM** The Action Gap Workshop, CoRL 2026
Talk & Live Demo: **Muta: An Offline AI Tutor for African Students** Moonshot by TechCabal, 2026
Lecture: **Neural Networks** TRI AI, 2026
Presentation: **Fuzzy-PID Controller for Liquid Level Control of Tank Systems** SEB4SDG, 2025
Talk: **From Campus to Career: Navigating the Engineering Journey** Redeemer's University, 2025
Lecture: **AI: Our Current Reality and Future Trajectory** Nigerian Society of Engineers, 2024
Lecture: **Deep Learning: Neural Networks** APWEN, 2024

Leadership & Service

Reviewer, Conference on Robot Learning (CoRL 2026) Workshops: Pretrain to Adapt Workshop, and Do Robots Need World Models? Workshop
Founder, The Classroom Project, 2026–Present
President, Association of Electrical and Information Engineering Students, 2024–2025
Member (National Champions), Enactus, 2021–2023

Technical Skills

Languages & Systems: Python, C++, SQL, Linux, Git
ML & Robotics: PyTorch, JAX, TensorFlow, Gymnasium, Stable-Baselines3, MuJoCo, ROS2, CasADi, W&B, llama.cpp
Cloud & MLOps: Docker, Kubernetes, AWS, GCP, SageMaker, Vertex AI, GitHub Actions, Prometheus, Grafana, OpenTelemetry