

OSAZEE ERO

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PROFESSIONAL SUMMARY

PhD-trained Applied ML Scientist/Engineer with 6+ years building and deploying ML for physical systems across manufacturing process monitoring, simulation acceleration, and materials R&D. Proven track record turning research into production-ready tools - multimodal vision + sensor fusion, surrogate modeling, and optimization/active learning. Experienced applying GenAI (RAG/LLMs, LoRA/QLoRA) to technical workflows, and delivering robust services with FastAPI, Docker/Kubernetes, and AWS.

TECHNICAL SKILLS

- **Applied ML (Physical Systems):** Computer Vision, Image Segmentation (U-Net), Anomaly Detection, Time-Series Modeling, Multimodal Learning/Sensor Fusion, Surrogate Modeling, Bayesian Optimization / Active Learning, Probabilistic Modeling, Model Evaluation & Calibration.
- **Deep Learning:** PyTorch, CNNs, ConvLSTM, Autoencoders, Transformers (applied)
- **GenAI:** RAG (LangChain, LlamaIndex), Vector DBs (e.g., Pinecone), Fine-tuning (LoRA/QLoRA), Prompting, Tool/Function-style workflows, Evaluation harnesses.
- **MLOps / Deployment:** FastAPI, Docker, Kubernetes, AWS (ECS/S3/Lambda/SageMaker as used), MLflow, CI/CD (GitHub Actions), Monitoring/Logging
- **Software / Data:** Python, SQL, NoSQL (MongoDB), Git, Linux, REST APIs.

PROFESSIONAL EXPERIENCE

Machine Learning Researcher (Simulation & Materials AI)

Oct. 2024 – Present

Phaseshift Technologies

Leveraging Generative AI to accelerate material discovery and optimize simulation workflows

- Designed and deployed a Retrieval-Augmented Generation (RAG) pipeline using LangChain and Pinecone to query vast internal technical documentation, reducing information retrieval time by 40%.
- Fine-tuned open-source LLMs on proprietary datasets to generate code for phase-field simulations, automating complex parameter configuration.
- Built RESTful inference APIs using FastAPI and Docker, deploying models to AWS ECS for scalable, low-latency access by teammates.
- Collaborated with domain experts to translate physical constraints into model loss functions, improving simulation accuracy by 15%.

Machine Learning Research Associate (Computer Vision)

Sep. 2024 – Present

Multi-Scale Additive Manufacturing Lab,

Developing real-time vision systems for industrial IoT applications.

- Developed a spatiotemporal Deep Learning model (ConvLSTM) for in-situ video monitoring, achieving 96% accuracy in detecting process deviations.
- Optimized heavy Computer Vision models (quantization & pruning) for deployment on edge devices, enabling <50ms inference latency for real-time control.
- Automated the ETL pipeline for high-throughput sensor logs, integrating SQL databases with on-premise storage for continuous model retraining.

Lead Software Developer / ML Engineer

Jan. 2023 – June 2024

Optifab Technologies

Led the engineering of AI-driven optimization software for advanced manufacturing.

- Designed a modular Python codebase for 3D simulation, enforcing strict software engineering standards (Unit Testing, CI/CD pipelines, Version Control).
- Managed the full lifecycle of the software product, from algorithm design to containerized delivery (Docker) for client installation.

Ph.D. Researcher (Deep Learning & Sensor Fusion)

Sep. 2020 – Jul. 2024

University of Waterloo, Canada

Pioneered Multi-modal Learning techniques for high-dimensional industrial data.

- Built full-stack ML pipelines processing TB-scale datasets of optical tomography images and time-series sensor data.
- Developed a custom U-Net and Autoencoder architecture for unsupervised defect segmentation where labeled data was scarce.
- Applied Gradient Boosting (XGBoost) and Probabilistic methods to correlate sensor telemetry with quality outcomes, identifying key feature importance.
- Mentored 5+ junior engineers on Python best practices, data annotation strategies, and experimental design.

EDUCATION

Ph.D., Mechanical and Mechatronics Engineering (AI Specialization) – University of Waterloo, Canada, July 2024

Thesis: Machine Learning & Optical Tomography for In-Situ Anomaly Detection.

Awards: Graduate Research Studentship; Iranian Student Memorial Scholarship (Academic Excellence).

M.Sc., Systems Engineering – University of Lagos, Nigeria, June 2016

B.Eng., Electrical/Electronic Engineering – University of Benin, Nigeria, November 2011

CERTIFICATIONS & AWARDS

- **AWS Certified Machine Learning Specialty** (In Progress)
- **Machine Learning Engineer Nanodegree** | Udacity (End-to-end SageMaker deployment)
- **OpenCV AI Competition Phase 1 Winner** | 2021
- **NITDA Scholar** | National Information Technology Development Agency

SELECTED PUBLICATIONS

1. Optical tomography and machine learning for in-situ defects detection in laser powder bed fusion: A self-organizing map and U-Net based approach (2023). **Additive Manufacturing**
2. An Integrated Fuzzy Logic and Machine Learning Platform for Porosity Detection using Optical Tomography Imaging during Laser Powder Bed Fusion (2024). **International Journal of Extreme Manufacturing**.