

# OSAZEE ERO

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## PROFESSIONAL SUMMARY

Applied Machine Learning Engineer with 5+ years of experience building scalable AI systems. Expert in bridging the gap between Deep Learning research and production deployment. Proven track record in Generative AI (LLMs), Computer Vision, and Time-Series Analysis. Specializes in fine-tuning Large Language Models (LLMs) for domain-specific tasks and developing RAG pipelines to unlock unstructured data. Deep expertise in MLOps, containerization, and cloud deployment, successfully translating high-dimensional sensor and imaging data into real-time decision-making systems.

## TECHNICAL SKILLS

- Deep Learning & GenAI:** LLMs (Llama 3, Mistral, GPT-4), Transformers (BERT, RoBERTa), RAG (LangChain, LlamaIndex), Fine-tuning (LoRA, QLoRA), Prompt Engineering, CNNs, U-Net, GANs, Autoencoders.
- Machine Learning:** Docker, Kubernetes, AWS (SageMaker, Lambda, S3), Azure, MLflow, Airflow, CI/CD (GitHub Actions), Grafana
- MLOps & Cloud:** Python, scikit-learn, PyTorch, TensorFlow, FastAPI, Docker, SQL/NoSQL, MongoDB, Cloud (Azure, AWS), CI/CD, Experiment Tracking
- Development:** Python (PyTorch, TensorFlow, Pandas), SQL, NoSQL (MongoDB), FastAPI, Flask, C++, Git

## PROFESSIONAL EXPERIENCE

### Machine Learning Researcher (GenAI & Simulation)

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 Engineer (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

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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

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- 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

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- 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*
- 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*.