Emmanuel Oladokun

GitHub | emmanueloladokun@hotmail.co.uk | LinkedIn | My Website

Summary

PhD graduate in Engineering Science from the University of Oxford specialising in **deep learning systems and synthetic data generation**. Experience building and iterating on **end-to-end training pipelines**, from data curation and preprocessing to model training and evaluation. Strong background in PyTorch and large-scale datasets, with a focus on **improving model performance through data quality, failure analysis, and iterative experimentation**.

Work and Research Experience

Alan Turing Intern, GCHQ
Jan 2024 – Jul 2024

- Curated and processed **large-scale image datasets (∼300k samples)** and built pipelines for training and evaluating generative models.
- Trained and evaluated deep learning models using PyTorch, improving **data quality, robustness, and model performance** through iterative experimentation.
- Analysed model outputs to identify **failure modes and data gaps**, guiding dataset improvements and increasing coverage.
- Built and ran scalable training workflows using **AWS Cloud** services (**S3**, **SageMaker**, **CloudWatch**) for data storage, model training, and experiment monitoring.

Software Developer & Supervisor, University of Oxford / GE HealthCare
Oct 2020 – Jun 2022

- Co-developed and maintained an **open-source tool** for automated validation of DICOM images, improving **data quality** within clinical ML pipelines while ensuring privacy compliance. ECIQC
- Led technical design and implementation using both C++ and Python, including setting up **CI/CD pipelines** and automated tests to ensure reliability as the codebase evolved.
- Improved reliability of downstream ML workflows by enforcing **data validation and consistency checks** within large-scale pipelines.
- **Supervised 5 PhD students**, mentoring on software development practices and contributing to key project deliverables.

Master's Thesis Research, University of Oxford
Oct 2019 – Jun 2020

- Used Python and MATLAB to develop mathematical and statistical models for the circadian blood pressure rhythm.
- Managed and performed statistical analysis on noisy data consisting of **4M records** from **208,948** hospital admissions.
- Delivered an independent research project under academic supervision within strict deadlines, achieving a **First Class Grade.**

Software Engineering Intern, Schlumberger
Jul 2019 – Sep 2019

- **Reduced computational costs by 30–50%** within a production reservoir simulator by using machine learning models.
- Successfully developed machine learning models using Scikit-Learn and TensorFlow.
- Swiftly adapted to a new **high-pressure environment**. Findings of this internship have led to a publication.

Undergraduate Research Assistant, University of Oxford
Jul 2018 – Sep 2018

- Researched Offshore Renewable Energy by modelling wind turbine dynamics as ODEs and solving them in MATLAB.
- Tackled challenges such as performing experiments using the **UK's largest functioning wave tank**.

Achievements

First-author Publications

- EchoLVFM: One-Step Video Generation via Latent Flow Matching for Echocardiogram Synthesis; (2026); EchoLVFM
  `Flow Matching`; `Video Generation`; **`GenAI`**; 🔥, 🤗
- From Transthoracic to Transesophageal: Cross-Modality Generation using LoRA Diffusion; MICCAI-ASMUS (2025).
  `Best Paper Award`; `Diffusion Models`; `Cross-Modality Learning`; `Parameter-Efficient Fine-Tuning`; 🔥, 🤗 , Proprietary
- Transesophageal Echocardiography Generation using Anatomical Models; MICCAI-DALI (2023).
  `Generative Adversarial Networks`; `Contrastive Unpaired Translation`; `Synthetic Data`; 🔥, Proprietary
- Machine-Learning Informed Prediction of Linear Solver Tolerance for Non-Linear Solution Methods in Numerical Simulation; ECMOR XVII (2020).
  `Random Forest Regression`; `Linear Algebra`; 🔝, Proprietary

Awards

- **OxAI Hackathon (Mar 2026):** Co-developed a prototype using transfer learning to estimate visceral fat proxies from facial imagery; built an end-to-end multimodal training pipeline in six hours, earning **3rd place.** Face2Visceral
- **Best Paper (Sep 2025):** Awarded **'Best Paper'** at ASMUS-MICCAI 2025 for paper addressing diffusion-based image generation using data from multiple domains.
- **Google HQ Hackathon (Oct 2019):** Co-conceived and developed a machine learning–based application to support handwriting learning for people with cerebral palsy and related needs. As a team, refined the concept and delivered a working **prototype in less than 24 hours**, earning **2nd place** out of 12 teams. HandRiGht
- **UKMT Maths Challenge (Nov 2015):** Awarded a Silver Certificate.

Skills

Programming Experience (Years):

Python **MATLAB** **C++**

Libraries & Cloud: HuggingFace, **PyTorch**, Torchvision, NumPy, SciPy; **AWS, S3**, Vercel.

Deep Learning Systems: training pipelines, dataset curation, model evaluation, experiment iteration

Methods: Generative modelling, (latent) diffusion models, foundation models, flow matching, representation learning, contrastive learning, vision-language models (e.g., CLIP), transformer architectures, **RAG, synthetic data generation.**

Education

DPhil Engineering Science CDT, University of Oxford

(period includes internship) Oct 2020 – March 2026

Since Oct 2021, in collaboration with GE HealthCare, applying **deep generative models** to create **synthetic datasets** for downstream tasks. Developed and trained deep learning models for synthetic data generation, used to augment training datasets and improve downstream task performance. Designed and iterated on **training pipelines**, including data preprocessing, model training, evaluation, and ablation studies. Demonstrated up to a **10% improvement** in model performance by **augmenting and rebalancing skewed real-world datasets with synthetic data** and counterfactuals. Work has produced first-authored publications and **international conference presentations**. Most recently developed a **flow-matching** method for **one-step latent video generation**, including **implementing a custom flash-attention processor**.

MEng Engineering Science (2:1), University of Oxford

2016 – 2020

Modules include: **Machine Learning** (Generative and Discriminative Models), Optimisation, Advanced Probability, Software Engineering; Medical Imaging and Informatics (**Deep Learning, Computer Vision**), and Image Processing.

Leadership and Service

Engineering Tutor, St Peter's College

2022

- Delivered tutorials in Mathematics and Physics to undergraduate engineering students, and assessed problem sheets.

Volunteer, THRIVE

Nov 2018 – Dec 2022

- Led weekly sports sessions for **50+ children** from deprived communities, mentoring participants while fostering teamwork, discipline, and leadership.

Alumni Relations Officer, St Peter's College, University of Oxford

Nov 2016 – Jun 2018

- Established strong ties as an ambassador through connecting undergraduates with alumni, and networking with professionals.
- Raised **£5,862** for the college during a telethon and learned protocols for dealing with sensitive and confidential information.

Interests

Football: Played collegiate football including inter-college 'Cuppers' competitions at Oxford; currently play for fun.

Drumming: Active drummer, rehearsing independently, corporately, and performing monthly in live services to congregations of up to **200** people.