SAMUEL OYENEYE

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RESEARCH INTEREST

As a Machine Learning Researcher, I find it impactful to reduce the high costs of sophisticated GPUs, which are unevenly distributed globally, while ensuring privacy. My interest lies in developing scalable, resource-efficient architectures to minimize the complexity of AI systems, focusing on trustworthiness. This includes exploring human neural capabilities to design sensitive, aware, and efficient algorithmic methods.

EDUCATION

BSc., Federal University of Agriculture, Abeokuta, Nigeria 2019 - 2024
Department of Computer Science

RESEARCH EXPERIENCE

ML Collective 2024 - present
Independent ML Researcher

- Co-Lead Investigator**, Privacy Isn't Free: Benchmarking the System Cost of Privacy-Preserving ML** 2025
  - **Advisor:** Steven Kolawole (CMU)
  - **Contribution:** Developed the YAML framework called PrivacyBench, which benchmarks the privacy-utility-cost of PPML techniques on CNN and Transformer baselines on medical image datasets. This research presents significant results on energy consumption, showing that a single or a combination of privacy techniques can cause, with clear metric highlights.

- Co-Lead Investigator**, Secure and Scalable Horizontal Federated Learning for Bank Fraud Detection** 2024
  - **Contribution:** Designed the HFL transformer architectures where we applied the technique on the BAF-base dataset, outperforming the majority techniques on the BAF comparison benchmark

- Co-Lead Investigator**, Understanding LLM Reasoning Capabilities through Rebus Puzzles** In progress
  - **Contribution:** Annotated and experimented on visual language models (VLMs) on a variety of tasks, ranging from zero-shot to few-shot, to investigate the performance of both proprietary and open source models on idiomatic rebus puzzles. The experiments highlight a clear gap in reasoning capabilities and Question-Answering of these models.

- Co-Lead Investigator**, Multimodal Agreement-Based Cascading (ABC)** In progress
  - **Advisor:** Steven Kolawole (CMU)
  - **Contribution:** Experimented with different multimodal LLMs of various sizes from 1B parameters to 80B+ parameters, on the MMLU benchmark, to apply the Agreement-Based Cascading efficiency method to see if we can prove that smaller models can achieve similarly significant results compared to bigger models

Cohere Labs, Aya Expedition Project 2025
ML Researcher

- Contributor**, Sparse Upcycling Aya Vision**
  - **Contribution:** Created an eval pipeline for the multimodal LlavaBench on the Aya Vision model. The research aims to reduce training FLOPs and improve convergence speed compared to conventional dense and traditional upcycling approaches on multimodal vision models

PUBLICATIONS

S=In Submission, W=Workshop, * Indicates Equal Contribution

[S.1] Nnaemeka Obiefuna, **Samuel Oyeneye**, Similoluwa Odunaiya, Iremide Oyelaja, Steven Kolawole. **PRIVACYBENCH: Privacy Isn't Free in Hybrid Privacy-Preserving Vision Systems**. (Accepted at ICML ES-FOMO Workshop [2025]). Under Review at WACV [2026] | **[pdf]**

[W.1] Nnaemeka Obeifuna*, ..., ..., **Samuel Oyeneye***. **Secure and Scalable Horizontal Federated Learning for Bank Fraud Detection**. (ICLR Advances in Financial AI Workshop 2025) | **[pdf]**

SELECTED WORK EXPERIENCE

Machine Learning Engineer (Contract), Remote 2024 - 2025
SDTCorp California, US

- Fine-tuned Llama-3.1 model on robot-framework data using Unslot, saving memory up to 70%, with no loss, achieving a 91% accuracy, then distilled to smaller sizes
- Deployed the model to AWS and integrated it into the software testing chatbot built with streamlit, with knowledge graph functionalities, incorporating RAG and Neo4j database

Python Engineer Intern 2023 - 2024
Vale Finance Limited Lagos, Nigeria

- Developed a Telcom service provider classification model with an accuracy of 96%, integrated with FastAPI
- Optimised backend process with Docker, with real-time responses and classification, incorporated with batch processing and authentication of the model's API

LEADERSHIP AND COMMUNITY SERVICE

- **Reviewer,** Deep Learning Indaba (Rwanda '25) 2025
  - Selected and reviewed 27 applicants' essays and submissions
- **Machine Learning Tutor,** Data Science Network, AI Invasion 2023
  - Facilitated hands-on classes for over 50 participants across age ranges of teens, young adults and adults, for a 5-day beginner to advanced machine learning tutorial
- **AI/ML Mentor,** Data Science Network, FUNAAB 2022 - 2023
  - Prepared study curriculum and tutored 5 mentees immersively on machine learning internals to build real-world projects
- **Core Team Community Lead,** Google Developer Student Club, FUNAAB 2021 -2022
  - Organised online and offline events, including technical tutorials, workshops and bootcamps for over 3000 students, empowering them with skills and expertise in the tech industry

SKILLS

- **Programming Languages:** Python (proficient), Golang
- **Frameworks & Libraries:** PyTorch, Hugging Face Transfomers, TensorFlow, Langchain, ADK (Agent Development Kit), Streamlit, Unsloth, Numpy, Pandas, Scikit-learn, Matplotlib, YAML, SGLang
- **Specialization:** Large Language Models (LLMs & VLMs), Finetuning, Knowledge Distillation, Optimization, Retrieval-Augmented Generation (RAG), Computer Vision (CNNs, ViT)
- **MLOps:** GCP, AWS, Render, Docker, FastAPI, YAML
- **Databases:** SQL (Postgres, MySQL and SQLite), GraphDB (Neo4j), VectorDB (Pinecone), MetricDB (Weight & Bias)
- **Tools:** Git & Github, Linux

AWARDS AND GRANTS

Simons Computational Neuroscience Imbizo Summer School (**~5% success rate**) 2025
Best Poster Award at Deep Learning Indaba 2025