# Henry Fordjour Ansah

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portfolio LinkedIn Github

## Education

**University of New Orleans,** PhD in Computer Science 08/2024 – present
Natural Language Processing, Commonsense Reasoning, Multimodal ML, Objective-Oriented ML

**Kwame Nkrumah University of Science and Technology,** 09/2017 – 11/2021
Bachelor of Science in Electrical and Electronics Engineering
**Relevant courses:** C Programming, Digital Computer Design, Analog Control Systems, Digital Control Systems, Multivariable Calculus, Numerical Analysis, Probability and Statistics.

## Research Interest

My research interest lies in the intersection between Multimodal Machine Learning, Natural Language Processing, and Reasoning. My research goal is to explore all the various ways to enable commonsense reasoning in vision and language models, drawing insights from the cognitive nature that surrounds the reasoning capabilities of biological entities.

## Research and Writing Experience

**Machine Learning Technical Writer - Paperspace**

- **Unpaired Image-to-Image Translation with CycleGAN:** Insights into the working mechanism of a Generative Adversarial Network and one of its popular variants, the cycle-consistent GAN.
- **Detecting and Localizing Pneumonia from Chest X-Ray Scans:** Inspired by the popular CheXpert effort by Stanford research, this writing delves into the realms of AI and medicine by exploring the fundamentals of using a neural network in pneumonia diagnosis.
- **Neural Machine Translation:** We explore some earlier techniques, such as the attention mechanism and Long Short-Term Memory employed in state-of-the-art translation models.

**Machine Learning Technical Writer - Datacamp**
**CoCa: Contrastive Captioners are Image-Text Foundation Models**: A writing covering the various lines of research of vision-language foundation models, their strengths and shortcomings, and how a contrastive captioning set-up subsumes the capabilities of all these models into a single model.

**Machine Learning Technical Writer - Neptune.ai**

- **Adversarial Attacks on Neural Networks - FGSM:** This piece captures the fascinating details of how even the most robust neural networks are vulnerable to the slightest of discrepancies in their input data.

**Machine Learning Technical Writer - Weights and Biases**

- **CLIP: Contrastive Language-Image Pretraining (Under Review) :** A contrastive set-up that learns a cross-modal alignment task between image and text and excels at zero-shot image classification and retrieval tasks.

**Machine Learning Technical Writer - Heartbeat ML**

- **Building a Data Pipeline with TensorFlow:** The tf.data API, a very powerful tool built into TensorFlow that provides the flexibility needed to build highly-optimized data pipelines for machine learning experiments.

**Technical Writer - All About Circuits**

- **Variational Autoencoder:** In this piece, we explore the key parts of an vanilla autoencoder and how a variational autoencoder improves on it.

## Professional Experience

**Mobile Engineer,** Ipay solutions 11/2022 – present

- Collaborated with product teams to design mock-ups for our digital POS mobile application.
- Employing modern practices to rewrite our digital POS mobile application with React Native.

**Site Reliability Engineer,** Stanbic Bank 11/2021 – 11/2022 | Accra, Ghana

- Developed monitoring dashboards for banking services in Splunk.
- Collaborated to build management systems in Angular for recording equipment metrics and stocks.

## Personal Projects

**Phi-2 Language Model - Unofficial PyTorch Implementation,** PyTorch, Python

- Implementation of Microsoft's latest research on the Phi language model using PyTorch.
- Updated model parameters with official pre-trained weights and used on several tasks such as code generation and Question and Answering.

**Deepseek Coder - LLAMA based instruct fined-tuned code generation model,** PyTorch, Python

- Implemented several recent architectural innovations in transformers such as the KV cache, pre-normalization, and Grouped Query Attention to improve inference speed and accuracy.

**Pneumonia Classification and Localisation from X-ray Scans,** Pytorch, Scipy, Matplotlib

- Designed a neural network to detect pneumonia in chest x-ray scans and draw a heatmap to indicate areas the neural network used to make decisions.

**Multimodal Sensor fusion with Unscented Kalman Filter,** C++, Eigen

- Implemented an Unscented Kalman Filter to estimate the state of multiple vehicles by fusing noisy lidar and radar data.

## Open Source Contributions

**MLX,** An array framework for machine learning on Apple silicon.

- Implemented the sigmoid neural network module.

**Appwrite,** End-to-end backend server for Web, Mobile, Native, or Backend apps.

- Created a demo function for creating a backup of every document of your database in Cloud Storage .

## Skills

Python • TensorFlow • PyTorch • Transformers • Numpy • Scipy • ROS • C++ • Docker • Javascript/Typescript • Transformers • Mongodb