Gregory Chukwunonyelum Igwebu Okoma

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Education

Lancaster University Lancaster, United Kingdom

MSci, Mathematics 09/2020 - 07/2024

- *Dissertation:* Variational Inference for Bayesian Posterior Approximation.
- *Relevant coursework:* Real Analysis, Bayesian Inference, Likelihood Inference, Probability Theory, Combinatorics, Metric Spaces, Topology & Fractals, Stochastic Processes, Lie Groups & Lie Algebras, Machine Learning.

Projects

Python Neural Network from Scratch GitHub

Personal project

- Implemented a highly generalizable Multi-Layer Perceptron (MLP) network in Python from scratch using the NumPy library.
- Implemention included a Kaiming He weight Initialization option, L2-regularization coefficient choices, and gradient checking.
- Analysed the effects of the following variables on convergence: Kaiming He Uniform weight initialization; L2-regularization; and four optimizers (Stochastic Gradient Descent, Momentum, RMSProp, and Adam).
- Documented the derivation of forward and backward propagation gradients (including the Jacobian form used for vector-valued activations like Softmax) along with the results of the analysis and a discussion of of the theoretical effects caused by each variable.

Python Deep Reinforcement Learning GitHub

Personal project

- Implemented an Advantage Actor-Critic (A2C) reinforcement learning agent integrated with an Intrinsic Curiosity Module (ICM) in Python using Gymnasium and PyTorch.

Financial Market Trading Algorithm

Personal project

- Created an algorithm to identify well-defined price structures formed in real time.
- Constructed a correctness proof for the algorithm.
- Implemented a python script to trade in real time using this algorithm.
- Evaluated multiple algorithmic trading strategies using back-testing and statistical performance analysis.

Experience

Pareto.AI, Alignerr

Mathematics Data Annotator 10/2024 - Present

- Created Olympiad/university-level mathematics prompts to be used as training data for the foundation models.

Private Mathematics Tutor 04/2022 - 10/2024

- Delivered A-Level and GCSE mathematics one-on-one tutoring sessions to students.

Certifications & Computational Skills

- **Certifications**: Machine Learning Specialization, *Coursera*; AWS Cloud Technical Essentials, *Amazon Web Services (AWS)*
- Python (PyTorch, Tensorflow, Pandas, NumPy, multiprocessing)
- Cloud computing (Amazon Web Services: EC2, Google Cloud Platform: E2)