Chinedu Eleh

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PROFESSIONAL SUMMARY

Applied mathematician and data scientist with six (6) years of practical experience in machine learning, mathematical modeling, statistics, neural networks, and large language models (LLMS). Experienced in machine/deep learning tools and APIs including Python **PyTorch**, **TensorFlow**, **Scikit-learn**, **SQL**, and **FEniCS**; with the ability to quickly adapt to other software packages for Big Data Analysis and Data Visualization.

TECHNICAL SKILLS

Programming Languages: Python (Pytorch, Scikit-learn, Pandas, NumPy), R, and SQL.
Statistical Analysis: Confidence Intervals, Hypothesis Testing, and Deviation Analysis.
Machine Learning and AI: Supervised Learning, Unsupervised Learning, Deep Learning, and AI.
Data Visualization and Reporting: Matplotlib, Seaborn, and Tableau.
Process Improvement and Methodologies: Agile and Lean Frameworks.
Other Tools: Git, Jupyter Notebooks, AWS Sagemaker, Cloud Computing, HTML, and CSS.

EXPERIENCE

Integrated Data Science Innovations Center (IDSI) Auburn, AL
Quantitative Analyst/Researcher 2022 - present

- Developed scalable machine learning solutions for handling large datasets, utilizing advanced Gaussian process methodologies with uncertainty quantification, facilitating accurate prediction, & effectively prioritizing human-assisted labeling for ambiguous cases.
- Implemented a computationally efficient Gaussian Process model (MuyGPs), which achieved an 83.8% accuracy rate in classifying low-resolution astronomical images and surpassed results from traditional Random Forests and Deep Neural Networks.
- Enhanced data preprocessing techniques, including rth root normalization and supervised UMAP embedding, to improve feature separability thereby boosting the accuracy of classifying stellar blends versus single stars in astronomical datasets.

Microsoft Teals Sylacauga, AL
Data Scientist/Project Coordinator Sept 2023 - May 2024

- Conducted in-depth data analysis which includes creating 10+ artifacts and enhancing problem-solving and creative thinking through hands-on projects in Python.
- Consulted with other team leads to develop a toolkit for knowledge transfer, aimed at improving the understanding of 30+ students in the '23-'24 Computer Science Discoveries.
- Facilitated cross-functional collaboration across teams by coordinating project timelines, optimizing resource allocation, and ensuring the successful delivery of strategic objectives.

Mathematical Sciences Research Institute Berkeley, CA
Data Science Intern July 2022 - September 2022

- Developed and applied computational methods for solving boundary and volume integral equations, with implications for predictive modeling and solving inverse problems in complex systems.
- Analyzed and interpreted spectral properties of mathematical operators, enhancing numerical approaches for feature extraction and data transformation in high-dimensional datasets.
- Collaborated in hands-on labs to apply advanced integral operator techniques, bridging mathematical theory and practical applications in data processing and machine learning.

PROJECTS

Deploying Sentiment Analysis Model (AWS Sagemaker) [demo]   2021 - 2022
- Utilized AWS SageMaker to train and deploy a machine learning model for a web-based application, enabling it to classify movie reviews as positive (POS) or negative (NEG) accurately.
- Designed and implemented a real-time interaction platform on AWS SageMaker, enhancing the app's usability & user experience by enabling immediate user feedback through an Endpoint API.

A Webapp that Interacts with a Database [demo]   Summer 2021
- Developed a console-based system using MySQL to manage backend database processes, laying the foundational architecture for integrating machine learning models.
- Created a web interface that interacts with the backend database, featuring an information display area, an input form for data entry, and a results area to showcase model outputs and predictions.

PUBLICATIONS

Eleh, C., Mwanza, M., Aguegboh, E., & van Wyk, H. W. (2024). GeoAdaLer: Geometric insights into adaptive stochastic gradient descent algorithms. arXiv preprint arXiv:2405.16255.

Eleh, C., Zhang, Y., Bidese, R., Priest, B. W., Muyskens, A. L., Molinari, R., & Billor, N. (2024). Stellar blend image classification using computationally efficient Gaussian processes. arXiv preprint arXiv:2407.19297.

Onyido, M. A., **Eleh, C**., Khachatryan, M., & Salako, R. B. (2024). Stability analysis of a two-stage structured diffusive population model with mixed dispersal mechanisms. *Applied Mathematics and Computations (In review)*.

SCHOLARSHIPS AND HONORS

- Honorable Mention, Elevating Mathematics Video Competition of the National Academies of Sciences, Engineering, and Medicine (2023).
- University of Nigeria. Award for Academic Excellence as the Best Undergraduate Student of the Department of Mathematics for 2015/16 Session.

EDUCATION

Auburn University, Auburn AL   2025
Ph.D. (Applied Mathematics) | M.Sc. (Data Science and Engineering)

African University of Science and Technology   2017
M.Sc. (Applied Mathematics)

University of Nigeria   2016
B.Sc. (Mathematics)