Sheikh Gaye

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Education

Cornell University, College of Engineering — Ithaca, NY
B.S. Computer Science, Minor in Artificial Intelligence — *Aug. 2026 – May 2030*

- **Cornell Data Science (DS Subteam)** 1 of 5 undergrads offered position after three-round interview process (behavioral, take-home, technical)

Parkland High School — Allentown, PA
GPA: 4.5/4.0 weighted | SAT: 1590/1600 (790 Math, 800 EBRW) — *2023 – 2026*

- **Founder & President, Computer Science Club:** founded the club after consolidating two dormant organizations; grew membership 20 → 70+, appointed a leadership team, and taught weekly sessions + organized competitive hackathon squads
- Coached two competitive programming squads to 1st and 2nd place against 18 regional high schools at the DeSales University Code Jam; helped launch a Girls Who Code initiative

Experience

Quantitative Analyst & Machine Learning Developer — Jan. 2025 - Apr. 2025
East African Commercial Bank (name withheld under NDA) — *Kigali, Rwanda*

- Sole developer of a vector autoregression (VAR) macroeconomic shock model forecasting GDP, inflation, exchange rates, and interest rates, then propagating those paths into loan-portfolio credit risk for ICAAP/ILAAP regulatory capital reporting
- Contributed the macro shock and stress-loss modeling behind a $\sim$ \$7M reduction in identified excess capital allocation
- Assembled and validated a 20+ year macro-financial panel from NISR, IMF, and World Bank sources, automating cleaning, reconciliation, and quality checks in Python and pandas
- Built a Monte Carlo stress-testing and scenario-simulation framework as a reproducible Jupyter workflow, with modeling assumptions formalized in written proofs and documented for regulator-facing review

Projects

ATLAS — Landslide Forecasting | *Python, TensorFlow, Google Earth Engine, Streamlit* — Feb. 2025 – Jan. 2026
https://github.com/shyagehike/atlas-v2

- Designed a parameter-efficient dual-branch CNN: 2D convolutions over static terrain and temporally asymmetric 3D convolutions over dynamic rainfall and soil-moisture sequences
- Built a geospatial ingestion and preprocessing pipeline over NASA, ESA, and NOAA archives via the Google Earth Engine API, with memory-optimized sampling of decades of climate data
- Produced uncertainty-aware hazard probabilities via Monte Carlo subsampling; diagnosed and corrected probability calibration using Brier score analysis
- Open-sourced the codebase with documentation for reproducibility; pitched the system to local Rwandan NGOs and ministries as a rural early-warning tool

Derived and Implemented a Deep Learning Framework from Scratch | *Python, NumPy*

- Built a deep learning framework's core from first principles: implemented a multilayer perceptron for handwritten-digit recognition (MNIST) with analytically derived backpropagation, matrix-vectorized forward and backward passes, and mini-batch gradient descent, using only NumPy
- Tuned initialization, activations, and learning rate against raw training dynamics rather than framework defaults; maintained as a public, documented repository

Technical Skills

Languages: Python, C/C++, SQL, HTML/CSS
Libraries: NumPy, pandas, statsmodels, TensorFlow/Keras, PyTorch, Matplotlib, Streamlit
Tools: Git/GitHub, Jupyter, Google Earth Engine, VS Code, Linux/CLI, Excel/Google Sheets
Methods: AI & Machine Learning, Probabilistic & Bayesian Modeling, Statistical Inference, Time-Series and VAR Modeling, Monte Carlo Simulation, Stress Testing & Scenario Analysis, Model Calibration & Diagnostics, Feature Engineering, Data Pipelines

Honors & Awards

AIMS Rwanda Finalist: top 30 mathematics students nationally; selected for Rwanda's national math camp, the training and selection pipeline for the International Mathematical Olympiad (IMO)
Johns Hopkins CTY: 291/350 on NWEA MAP mathematics (>99.9th percentile)
DeSales University Code Jam: 1st and 2nd of 18 schools