

Angela A. Boakye Danquah

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PROFESSIONAL SUMMARY

Software Engineer and Computational Research Scientist with 2+ years of experience developing production-grade AI/ML systems, cloud-based data infrastructure, and analytical pipelines. Deep expertise in Python, PyTorch, TensorFlow, and Hugging Face; demonstrated success architecting HIPAA-compliant AWS applications, deploying multi-GPU deep learning systems, and engineering at terabyte scale. Skilled in translating mission requirements into robust, secure software solutions across research and enterprise environments.

EXPERIENCE

Computational Research Scientist

Dec 2023 – Present

University of Virginia — Data Analytics Center | Research Computing | ITS | Charlottesville, VA

- Design and develop production-grade AI/ML pipelines and applications using PyTorch, TensorFlow, and Hugging Face transformers across diverse research domains including medical imaging, NLP, and social network analysis.
- Architect secure, cloud-based data systems on AWS (VPC isolation, Lambda, S3, DynamoDB, IAM) following security-by-design principles; coordinated with compliance and IRB teams for HIPAA/FISMA-aligned deployments.
- Engineer and maintain large-scale distributed data systems processing billions of records across TB-scale datasets on HPC infrastructure (SLURM), optimizing for performance, scalability, and reliability.
- Build and deploy containerized applications (Docker/Apptainer) and develop CI/CD-compatible workflows for reproducible, maintainable AI/ML systems.
- Lead cross-functional collaborations with faculty, administrators, and research teams to gather requirements, define system architecture, and deliver analytical solutions — communicating complex technical findings to non-technical stakeholders via interactive dashboards (Plotly, Tableau).
- Mentor junior researchers and contribute to technical standards, improving code quality, documentation, and team productivity.

SELECTED AI/ML ENGINEERING PROJECTS

HIPAA-Compliant AWS AI Application | Rare Cancer Research Lab

- Designed full-stack cloud architecture: React frontend, serverless backend (Lambda, Internal Load Balancer, S3, DynamoDB), VPC with dual-VPN connectivity (UVA HSVPN + site-to-site), IAM least-privilege access, and audit logging.
- Integrated AWS Textract and Comprehend Medical for AI-powered extraction of PHI from unstructured documents; orchestrated document processing pipeline with robust error handling and security controls.

Glaucoma Progression Prediction | Deep Kernel Learning Research

- Developed and maintained production deep learning training pipelines using PyTorch; implemented RNN, GRU, LSTM, Transformer, and Neural CDE architectures with multi-GPU support on HPC cluster.
- Built robust checkpoint management, seed-controlled reproducibility, and multi-experiment orchestration systems enabling systematic model comparison and rebuttal-quality ablation studies.

BlueSky Social Network Analysis | Large-Scale NoSQL System

- Engineered ~7B-record (~3 TB) MongoDB system with advanced sharding, indexing, and aggregation pipelines; developed real-time data ingestion utilities and migration tooling for high-volume network science research.

BIA Historical Document Digitization | Vision-Language AI Pipeline

- Building GPU-accelerated pipeline to extract structured data from 1.4 million historical index cards using vision-language models; managing full data engineering lifecycle from ingestion through validation and storage.

ECG Heart Classification | Foundation Model Adaptation

- Adapted transformer foundation models with custom CNN and LSTM heads (ResNet/VGG) for 1-D ECG classification; trained on 300K ECGs achieving 0.89 specificity / 0.91 sensitivity.

EDUCATION

Master of Science in Data Science — University of Virginia

May 2023 | GPA: 3.9/4.0

Graduate Fellowship for Inclusive Excellence Award

Coursework: Bayesian ML, Big Data Systems, Deep Learning, Advanced Quantitative Analysis

Bachelor of Arts in Statistics & Economics — University of Virginia.

May 2021

TECHNICAL SKILLS

AI/ML Frameworks: PyTorch, TensorFlow, Hugging Face Transformers, Scikit-learn, JAX, LangChain — LLMs, NLP, Computer Vision, Time-Series

Cloud & Infrastructure: AWS, Azure, Docker, Apptainer, HPC/SLURM, CI/CD

Languages & Tools: Python, SQL, R, Bash, Git, MongoDB, PostgreSQL, Apache Spark, Dask, Airflow, Hadoop

Software Engineering: DevOps, Agile, secure coding practices, RESTful APIs, React, distributed systems, performance tuning, ETL pipelines

LEADERSHIP & PROFESSIONAL ENGAGEMENT

- Organizer, Journal Club at UVA Research Computing — facilitates technical discussions on data science and ML methodologies
- Contributor to research publications and grant proposals across multi-disciplinary UVA research teams
- Professional memberships: SIAM, American Statistical Association, Women in HPC (WHPCVA)