

Erica Brooks

DATA SCIENTIST | MACHINE LEARNING ENGINEER

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Summary

Machine Learning Engineer specializing in MLOps, NLP, biometric authentication, and AI deployment in regulated industries. Combines a strong foundation in pharmaceutical data systems and compliance with advanced machine learning expertise. Experienced in designing and deploying production-ready ML solutions leveraging Python, GCP, Docker, and Milvus, with a focus on model validation, monitoring, and explainability to ensure operational excellence and regulatory alignment.

Skills

Programming	Python, R, SQL, SAS, LaTeX
Packages	NumPy, Tensorflow, Keras, PyTorch, Pandas, Matplotlib, Plotly, Scipy, Librosa, Whisper, SciKit-Learn
Tools	VSCode, RStudio, Github, AWS, GCP, Jupyter(Anaconda), Milvus VDB, Docker, PowerBI, Tableau
Machine Learning	NLP, Linear/Logistic Regression, Decision Trees and Forests, Support Vector Machines, Transformers, Gradient Boosting Machines, Clustering (K-means, KNN, DBSCAN), Principal Component Analysis (PCA), Model Monitoring, Explainability, MLOps
Deep Learning	LLMs, Convolutional Neural Networks (CNN), Recurrent Neural Networks (RNN), Generative Adversarial Networks (GAN), Reinforcement Learning (RL)
Core Competencies	Machine Learning and AI Algorithms Data Science and Statistical Analysis Software Validation and Compliance System Performance Optimization and Cross-Functional Team Collaboration Training and Mentorship Data Engineering Digital Transformation and Automation Natural Language Processing Project Management Leadership Cloud Computing and Infrastructure Management Model Deployment and Scaling, Standard Operating Procedures (SOPs) Development

Experience | Research

Graduate Capstone and Independent Research Projects

Voice Biometric Authentication [GitHub](#) | [Journal](#) | [Youtube](#)

AUTHOR | CAPSTONE PROJECT

- Developed a voice biometric authentication system designed for high verification accuracy and low-latency retrieval, leveraging vector embeddings, deep learning models, and LLMs for scalable speaker recognition.
- Deployed the solution on GCP Cloud Run with Docker containers, integrated Milvus vector database, and incorporated robust model monitoring practices.
- Applied data validation and traceability principles to ensure compliance-readiness.

NLP SOP Search Engine

RAG APPROACH

- Designed and implemented an AI-assisted SOP search system combining Retrieval-Augmented Generation (RAG) pipelines with Azure storage.
- Created security and compliance architecture tailored to GxP environments, emphasizing explainability and responsible AI principles.
- Led the development of validation and SOP documentation frameworks to support production deployment.

Reinforcement Learning

TRADING SIMULATION

- Built a reinforcement learning agent (Deep Q-Learning) to simulate trading strategies in a sandbox environment.
- Engineered custom reward functions to balance profitability and risk, applying model evaluation and monitoring techniques.
- Visualized trading performance using Python dashboards and backtesting workflows.

Pharmaceutical Data Management

DATA MANAGER

- Managed Global Laboratory Information Management Systems (GLIMS) supporting compliance with GxP and FDA regulations.
- Developed automated workflows for data ingestion, reporting, and audit trail generation.
- Collaborated cross-functionally to align data management practices with regulatory requirements.

Professional Experience

Bausch + Lomb

Greenville, SC

QUALITY SOFTWARE SPECIALIST

SAFEGUARD THE ACCURACY AND COMPLIANCE OF COMPUTERIZED LABORATORY SYSTEMS THROUGH METICULOUS DATA

Oct 2019 - Present

EVALUATIONS AND RIGOROUS VALIDATION TECHNIQUES.

- Developed and validated automated systems under regulatory compliance frameworks (GxP, FDA 21 CFR Part 11), aligning workflows with best practices in model validation and software lifecycle management.
- Led digitization efforts across laboratory systems, enhancing workflow efficiency and data integrity while applying principles akin to MLOps and model governance.
- Implemented deployment pipelines and change management processes to support production environments requiring high reliability and compliance.
- Collaborated with cross-functional teams and documentation that mirrors ML model governance in regulated environments.
- Drafted, updated, and refined Standard Operating Procedures (SOPs), validation protocols, and user requirements to meet stringent regulatory and operational standards.

Bausch + Lomb

Greenville, SC

ASSOCIATE TRAINER III

TRAINED AND MENTORED NEW ASSOCIATES IN THE OPERATIONAL PROCEDURES, PRODUCT KNOWLEDGE, AND QUALITY

Jul 2014 - Oct 2019

STANDARDS IN LINE APPLICABLE COMPLIANCE WITH REGULATORY REQUIREMENTS AND COMPANY POLICIES.

- Developed and launched video training programs, resulting amplifying team engagement and knowledge retention, leading to improved training efficiency and reduced on-boarding time.
- Drafted and enforced e-learning materials for site and departmental use, aimed at streamlining training processes and improving accessibility for remote and in-person employees.
- Revamped and updated the training process, integrating multimedia content to accommodate diverse learning styles and improve overall training effectiveness.
- Cut training time through the creation of streamlined by keenly focus on training materials, resulting in improving learning retention and reducing on-boarding duration.

Siemens (BASF Chemical Company)

Anderson, SC

ADDITIONAL EXPERIENCE:

LEAD COMPUTER OPERATOR II

Sept 2005 - Nov 2013

- Oversaw system performance and application batch processing, resolving hardware failures and initiating system restores.
- Managed operations in the LAN/Server room, ensuring seamless system functionality and infrastructure reliability.
- Diagnosed and resolved system failures, proactively addressing issues that impacted business productivity.
- Optimized batch job schedules and performed database and file restores, ensuring efficient operations and data integrity.

Education

Southern Methodist University

Dallas, TX

M.S. IN DATA SCIENCE

2025

East Tennessee State University

Johnson City, TN

B.S. IN COMPUTER SCIENCE, MINOR IN MANAGEMENT

2005

Licenses + Certifications

Project Management Institute

National

PROJECT MANAGEMENT PROFESSIONAL, PMP

April 2022 - April 2028