

TOBIOLA OGUNBOWALE

Laboratory Informatics Engineer | Digital Health Solutions Project Manager

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PROFESSIONAL SUMMARY

CAPM-certified project manager with 10 years of experience managing laboratory operations, digital health implementations, and AI/ML systems. Currently build production AI tools for lab automation at University at Buffalo. Previously scaled COVID-19 testing operations to process over 1 million samples while maintaining 95% accuracy. Combine hands-on laboratory experience (PCR, ELISA, molecular diagnostics) with modern software engineering and machine learning. Passionate about building practical AI systems that solve real problems in healthcare

TECHNICAL PROJECTS

Medical AI Agent | github.com/tobilola/medical-ai-agent

- Built autonomous AI agent that reasons through clinical questions using multi-step planning and dynamic tool selection
- Created 5 clinical tools: patient data query, PubMed literature search, drug interaction checker, clinical calculators, and SOAP note generator
- Designed agent reasoning loop that breaks complex medical queries into steps, validates results, and self-corrects errors
- Built RAG system with vector database containing medical guidelines and clinical protocols for evidence-based recommendations
- Technologies: LangChain, OpenAI GPT-4, ChromaDB, FastAPI, Streamlit, PostgreSQL

Requia Lab Management System | *Production System - Currently in Use*

- Deployed lab order tracking platform currently used by Adelaiye-Ogala Lab at University at Buffalo for managing consumables and procurement workflows
- Integrated 5 machine learning models: predictive reordering using time-series analysis, spending forecasts with moving averages, anomaly detection for unusual ordering patterns, vendor recommendations based on price and reliability, and bulk order optimization
- Built grant-based spending tracker with audit-ready reporting for NIH compliance requirements, reducing report generation from 2 hours to 5 minutes
- Technologies: Python, Streamlit, Firebase, Scikit-learn, Pandas, Prophet/ARIMA, Render

LIMS-ELN Integration Platform | github.com/tobilola/LIMS-ELN_Integration

- Designed middleware platform for bidirectional data synchronization between Laboratory Information Management Systems and Electronic Laboratory Notebooks
- Trained 3 machine learning models: anomaly detection using Isolation Forest to identify unusual sample patterns, entity extraction with spaCy NER for automated metadata capture, and compliance scoring to ensure FDA 21 CFR Part 11 requirements
- Built asynchronous data pipelines capable of processing 1000+ samples daily with complete audit trail documentation
- Technologies: Python, FastAPI, PostgreSQL, MongoDB, Redis, Docker, Scikit-learn, spaCy

Regulatory Compliance Tracker | github.com/tobilola/compliance-tracker

- Created automated compliance monitoring system with OCR document processing and NLP analysis for pharmaceutical laboratories
- Developed 5 machine learning models including document classifier achieving 94.5% accuracy using Random Forest, compliance scorer with Gradient Boosting for risk assessment, entity extractor for automated data capture, anomaly detector, and text similarity analyzer
- Built real-time dashboard with gap analysis and document expiration tracking supporting FDA 21 CFR Part 11, GLP, and ISO 17025 standards

- Technologies: Python, Tesseract OCR, Scikit-learn, spaCy, Transformers, PostgreSQL, React

PROFESSIONAL EXPERIENCE

Research Systems Operations Manager

University at Buffalo, Department of Medicine | 2024 - Present | Buffalo, NY

- Design and implement AI-powered systems for laboratory automation including inventory tracking, equipment scheduling, and workflow optimization across \$2M+ research portfolio
- Lead cross-functional teams of 15+ across laboratory operations, IT, and research departments to integrate LIS/LIMS with clinical workflows
- Deployed predictive systems that reduced operational costs by 60% while maintaining compliance with IRB, HIPAA, and IACUC standards
- Built analytics dashboards that improved forecasting accuracy by 20% for portfolio resource planning and budget allocation

Graduate Research Assistant - Bioinformatics & Laboratory Informatics

SUNY Center for Excellence in Bioinformatics & Life Sciences | Nov 2022 - Dec 2023 | Buffalo, NY

- Coordinated bioinformatics research projects using computational infrastructure, managing timelines, resources, and stakeholder communications across laboratory operations and IT teams
- Designed and optimized bioinformatics pipelines using Snakemake and Nextflow on HPC infrastructure, processing large-scale genomic datasets
- Developed and implemented standard operating procedures (SOPs) for research workflows, ensuring consistent processes and knowledge retention
- Established quality control procedures for NGS datasets using Seurat, Cell Ranger, and GATK, implementing validation workflows that improved data accuracy
- Configured LIMS workflows for automated biospecimen tracking, integrating laboratory automation with computational analysis pipelines

Digital Transformation Lead

Afri-Global Medicare Limited | June 2020 - Aug 2021 | Lagos, Nigeria

- Led enterprise laboratory transformation during COVID-19 pandemic, processing 1 million+ diagnostic samples while maintaining 95% accuracy and regulatory compliance
- Achieved 95% user adoption within 6 months on LIS implementation (EPIC Beaker, Cerner) across multi-site diagnostic operations
- Cut diagnostic turnaround time by 35% through workflow optimization, laboratory automation configuration, and process re-engineering
- Scaled COVID-19 testing operations 300% in 3 months while maintaining quality control protocols, CLIA compliance, and data integrity
- Built and managed 15+ person cross-functional team across laboratory operations, IT infrastructure, and clinical workflows

Project Manager & Data Analyst

Field Approach Consult | March 2017 - June 2020 | Lagos, Nigeria

- Managed 500+ participant clinical research study coordinating international teams across Nigeria and Germany for hepatitis epidemiological intelligence initiative (Ambrose Ali University × Bernhard Nocht Institute for Tropical Medicine)
- Led multi-jurisdictional population health research across 5 local government areas with strategic field operations, data collection, and advanced statistical analytics
- Coordinated cross-functional teams across multiple time zones, establishing communication protocols and meeting schedules to ensure project alignment and deliverable completion
- Conducted data analysis using Python and R for epidemiological modeling, generating policy-level insights for global health strategy development

- Developed project plans, monitored progress, and adjusted timelines and resource allocation based on evolving stakeholder needs and research requirements

Laboratory Operations & Technology Coordinator

University of Lagos - Central Research Laboratory | Dec 2014 - Feb 2017 | Lagos, Nigeria

- Coordinated laboratory technology implementation projects, managing timelines, resources, and stakeholder communications across research and operations teams
- Performed molecular diagnostic work including PCR, RT-PCR, ELISA, and gel electrophoresis for clinical and research applications
- Developed and implemented quality control systems using Lean Six Sigma methodologies to improve laboratory processes and reduce error rates
- Led cross-functional project teams for laboratory operations modernization and technology integration initiatives
- Created standardized protocols and SOPs for laboratory operations, data management, and regulatory compliance documentation

EDUCATION

Master of Science, Biomedical Informatics | University at Buffalo | Dec 2023

Relevant Coursework: Machine Learning, Healthcare Data Integration, Bioinformatics, Clinical Research Informatics

Master of Science, Medical Microbiology | University of Lagos | Dec 2016

Bachelor of Science, Microbiology | Redeemer's University | Aug 2012

CERTIFICATIONS

Certified associate in project management (CAPM) | Project Management Institute (PMI)

TECHNICAL SKILLS

Programming: Python, JavaScript, SQL, Bash, Git/GitHub

AI & Machine Learning: LangChain, OpenAI GPT-4, Scikit-learn, spaCy, ChromaDB, RAG systems, Time-series forecasting (Prophet, ARIMA), Anomaly detection, NLP

Laboratory Informatics: LIMS/LIS (EPIC Beaker, Cerner, Meditech, Sunquest), Biospecimen tracking, Lab automation, PCR, RT-PCR, ELISA, Gel electrophoresis

Web Development: FastAPI, React, Streamlit, REST APIs, Docker

Data & Databases: PostgreSQL, MongoDB, Firebase, Redis, Pandas, NumPy, Data pipelines

Cloud: Firebase, Google Cloud Storage, Docker, Render

Bioinformatics: Snakemake, Nextflow, Seurat, Cell Ranger, GATK, HPC computing, NGS analysis

Healthcare Compliance: HIPAA, CLIA, FDA 21 CFR Part 11, GLP, ISO 17025, IRB, IACUC

Project Management: CAPM certified, Agile/Scrum, Lean Six Sigma, DMAIC, Risk assessment, Change management