IHUNNA AMUGO, MHA, M.S., R.E.H.S.
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HEALTH DATA ANALYST | PYTHON • SQL • TABLEAU • EPIC/AXIUM • FHIR
PUBLIC HEALTH INFORMATICS | HEALTH POLICY RESEARCH | EPIDEMIOLOGICAL ANALYSIS | PROGRAM EVALUATION | CRISIS INTERVENTION

Tech Stack: Python (pandas, scikit-learn) • SQL (PostgreSQL, BigQuery) • R • Tableau • Power BI • Git • Streamlit • CVAT • NLP

Summary - Clinician-turned-data-scientist who translates messy health data into dashboards, predictive models, and policy briefs that cut manual workload, surface equity gaps, and strengthen regulatory compliance. Six years of frontline public-health, clinical, and ML project experience; excels at bridging end-user needs and engineering execution. Multidisciplinary healthcare leader and AI/ML researcher pursuing DDS and PhD in Computational Engineering. Expertise in digital twin simulation, transcriptomics, ChatGPT research, health equity, and public health data systems. Committed to applying computational tools to dentistry, molecular biology, and real-world decision support.

Selected Projects

- Digital Twin Platform for Predictive Surgical Modeling (PhD Research, 2024–2029)
- Python, OpenFOAM, Abaqus, TensorFlow, Paraview, CUDA, MPI
- Developing a multiscale hybrid framework that fuses FEM, PINNs, and AI for modeling immune response, surgical tissue behavior, and transplant rejection risk. Built organ-specific digital twins for real-time robotics simulations and clinical predictions.
- AI for Health Equity – NCATS/AIM-AHEAD Traineeship (2024)
- Palantir Foundry, Python, Scikit-learn, SMOTE, R
- Led ML-based analysis of >350,000 COVID-19 EHRs to identify cardiovascular health disparities across race, sex, and vaccine status. Earned Outstanding Oral Presentation Award at AI4Health Symposium; manuscript pending.
- Medicaid Dental Policy Dashboard (2023)
- Tableau, CMS API, Python
- Created a dental reimbursement policy visualization tool adopted by advocacy NGOs for state-level Medicaid testimony. Enables evidence-based resource allocation and reform prioritization.
- Environmental Inspection Route Optimizer (2022)
- Python, GeoPandas, scikit-learn, QGIS
- Trained machine learning model to optimize public health inspection routes using risk codes, location data, and violation frequency. Reduced theoretical inspection time by 22% across 6 jurisdictions in simulation.

Professional Experience

- Crisis Counselor | 988 Suicide & Crisis Lifeline | Remote | 2023–Present
- Documented 100% of cases under HIPAA compliance; mentored junior counselors; implemented QA rubric reducing documentation errors 40%.
- Dental Technician/Assistant | CAMcare Health Org., NJ | 2021–2022
- Managed Epic for 85+ patients/week. Improved operatory turnover and reduced no-shows by 15% through patient education.
- Communicable Disease Investigator | Gloucester Co. Health Dept. | 2020–2022
- Queried 26K records (SQL) and built R dashboards to flag disease clusters. Led COVID/STI tracing and education campaigns.
- Gloucester County Health Dept., 2020–2022
- Built predictive dashboards using R & SQL; collaborated with state epidemiologists to guide resource allocation.
- Designed internal ML model to flag inspection sites with high recurrence risk (precursor to route optimizer project).

Education & Certifications

- PhD – Computational Engineering (Health AI focus), Mississippi State Univ. | Expected 2029
- Mississippi State University | Expected 2029
- Dissertation: Multiscale Computational Modeling of Immune-Driven Outcomes in Surgery and Transplantation
- Research includes real-time surgical simulation, transplant rejection prediction, and hybrid AI-FEM model design for robotic applications.
- DDS Candidate, Meharry Medical College | Expected 2026
- MS – Health Informatics & MHA, Saint Joseph's University | 2022
- BS – Biology & Interdisciplinary Health Services, Saint Joseph's University | 2020
- REHS – Registered Environmental Health Specialist (NJ #B-168583)
- Certs: UT-Austin AI/ML (2024), AIM-AHEAD NCATS (2024), Crisis Counseling Fundamentals

Research & Recognition

- Digital Twin Brain Model – Simulates perfusion, viability, and treatment response; uses Python, Streamlit, NumPy, ROC, and clinical thresholds for brain death prediction.
- AIM-AHEAD ML Project – Investigated health disparities in COVID-19 mortality using N3C structure; built ML pipelines with SMOTE, feature importance, and policy visualization.
- Chatbot research exploring usability in dental schools
    - "ChatGPT to enhance learning in dental education at a historically black medical college" published by journal Dental Research and Oral Health
- Undergraduate Research Assistant; S. meliloti Transcriptome Research – Used Excel, MEME, and TOMTOM to identify regulatory motifs controlling genes downstream of Sma0113/Sma0114 signal transduction system – Regulatory Genomics & Motif Discovery
- Saint Joseph's University, Dept. of Biology (2017–2020)
- PI: Dr. Catalina Arango
- Conducted transcriptome-wide differential expression analysis of Sinorhizobium meliloti using Excel and statistical screening to identify Sma0114-regulated genes.
- Used MEME Suite to perform motif discovery on upstream regions of DE genes, revealing potential regulatory sequences associated with succinate-mediated catabolite repression (SMCR).
- Applied TOMTOM algorithm to compare discovered motifs to known bacterial transcriptional regulators, aiding in putative pathway mapping.
- Investigated downstream signaling of Sma0114 (a non-DNA binding response regulator) via inferred motif convergence.
- Designed and evaluated synthetic promoter-reporter constructs (e.g., PmelA:lacZ) to validate regulatory sequence behavior.
- Presented findings at NEMPET and LaSalle University Biology Symposium, and contributed to broader modeling of SMCR regulatory logic.

Technical Skills

Languages/Tools: Python, SQL, R, Tableau, Power BI, HTML/CSS, Git, C++, MATLAB, Streamlit, Tableau, MEME Suite, TOMTOM, COMSOL, Jupyter, Git

Frameworks: OpenFOAM, COMSOL, Abaqus, TensorFlow, PyTorch, Scikit-learn, Streamlit

Methods: NLP, PINNs, FEM, PDEs, HPC (MPI, CUDA), EHR integration, policy analysis

ML Techniques: Regression, Random Forest, Clustering, SMOTE, ROC, NLP

Health Systems: Epic, CommCare, ChatGPT API, PACS workflows

Technical Skills Volunteering Highlights

- Hospice Music Therapy, Highpoint & South Valley Hospice – Clarinetist
- Special Olympics TN – Mental health, dental screening, event support
- Dental Clinics – Mid-South Mission, Salt Wagon, Agape
- Immigrant Learning, MABVI, and CONTACT Helpline Volunteer