

JONATHAN AKHAGBOSU

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PROFESSIONAL SUMMARY

PhD Candidate in Industrial Engineering and Operations Research with deep proficiency in Python, R, and advanced optimization techniques. Passionate about transforming complex operational challenges into actionable, data-driven insights through advanced modeling and analysis.

EDUCATION

University of Massachusetts Amherst	<i>2023 - Present</i>
PhD (<i>in view</i>) Industrial Engineering and Operations Research	
University of Ibadan, Nigeria	<i>2016 - 2021</i>
BSc. Industrial and Production Engineering (First Class Honors)	

TECHNICAL SKILLS

- Programming: Python, R, AMPL, Gurobi
- Tools: Microsoft Office Suite, Google Workspace
- Core Competencies: Stochastic Modeling, Operations Research, Data Analytics

PROJECTS

Healthcare Optimization

Surgical Workload Quantification & Queueing-Based Tradeoff Analysis

- Developed a novel data-driven surgical workload classification using unsupervised learning (clustering) on large healthcare dataset.
- Integrated workload classes into a stochastic queueing model to quantify tradeoffs between pre-surgery waiting time and surgeon utilization under uncertainty.
- Conducted sensitivity analysis on staffing levels and priority rules, showing up to 82.5% reduction in waiting time for lowest-priority cases via additional staffing and 42.5% reduction via priority reordering without increasing utilization.

Equitable Surgical Case Allocation via Stochastic Integer Programming

- Formulated a stochastic integer optimization model to allocate surgical cases while explicitly incorporating workload equity among surgeons.
- Defined equity using a pairwise envy-based metric and minimized inequity, while also incorporating uncertainty in cases durations.
- Applied the model to data from a US Medical center, achieving up to 70% reduction in maximum pairwise workload envy relative to baseline practices.

Aviation

Pilot Fatigue Analytics & Risk Indicator Identification

- Analyzed pilot fatigue using operational flight metrics combined with subjective and objective fatigue measures.
- Developed decision tree and regression models to identify key fatigue-related indicators and characterize relationships between workload, duty patterns, and fatigue outcomes.
- Translated model results into interpretable indicators for assessing fatigue-related operational risk.

EXPERIENCE

University of Massachusetts Amherst

2023 - Present

Research Assistant

- Designed and implemented advanced mixed-integer optimization models using Gurobi and Python for complex industrial engineering research projects across different industries, including healthcare and aviation.
- Developed stochastic optimization models and performed rigorous data analysis to evaluate system performance under uncertainty, identifying key risk factors and improvement opportunities that informed robust design recommendations.
- Collaborated closely with faculty and research teams to author peer-reviewed publications, prepare comprehensive technical reports, and deliver results through conference presentations, contributing to successful dissemination of novel methodologies.

Anambra State Polytechnic, Nigeria

2022 – 2023

Graduate Assistant

- Managed end-to-end administrative projects and coordinated large-scale events for 200+ participants, ensuring seamless execution, on-time delivery, and high attendee satisfaction through meticulous planning and stakeholder collaboration.
- Streamlined record-keeping and reporting processes using advanced MS Office tools (Excel, Word, PowerPoint), reducing administrative errors and cutting monthly reporting time while maintaining 100% accuracy and compliance.

Chevron Nigeria Limited, Nigeria

2020

Joint Ventures (JV) Relations Intern

- Supported effective stakeholder communication and data management for joint venture operations.
- Contributed to the preparation of compliance reports and required documentation for regulatory agencies, specifically the Nigerian National Petroleum Corporation (NNPC) and Department of Petroleum Resources (DPR).

PUBLICATIONS

- **Akhagbosu, J.**, Capan, M., & Kamine, T. H. (2025). A Learning-based Queuing Approach to Measure Surgical Workload and Inform Case Prioritization Policies. In *IISE Annual Conference. Proceedings* (pp. 1-6). Institute of Industrial and Systems Engineers (IISE).
- **Akhagbosu, J.**, Capan, M., Balasubramanian, H., & Kamine, T. H. (2025). Characterizing Surgeon Workload with EHR Data to Predict Time Interval Between Surgeries and Postoperative Care Delivery. [Manuscript submitted for publication to the Journal of the American Medical Informatics Association].

CONFERENCE PRESENTATIONS

- **Akhagbosu, J.**, Capan, M., & Kamine, T. H. (2025, June). *A Learning-based Queuing Approach to Measure Surgical Workload and Inform Case Prioritization Policies*. IISE Annual Conference, Atlanta, GA.
- **Akhagbosu, J.**, Capan, M., Balasubramanian, H., & Kamine, T. H. (2025, October). *A Stochastic Optimization Approach to Robust and Equitable Surgeon Workload Allocation*. IISE Annual Meeting, Atlanta, GA.

AWARDS

- NNPC/Total Energies Undergraduate Scholarship 2016-2021

OTHER PROFESSIONAL ACTIVITIES AND SERVICES

- Member, Institute for Operations Research and the Management Sciences (INFORMS)
- Member, Institute of Industrial and Systems Engineers (IISE)
- Member, National Society of Black Engineers (NSBE)

LEADERSHIP & VOLUNTEERING

- **Volunteer Member** – Environmental Community Development Service. 2022 - 2023
- **Sports Director** – Industrial Engineering Students' Association. 2020 - 2021
- **Volunteer Member** – Oyo State COVID-19 Relief Package Distribution Team. 2020