

Eloghosa Anderson Ikponmwoba

Louisiana, United States — +1 225-441-7112 — eloghosaefficiency@gmail.com —
[linkedin.com/in/eloghosa-ikponmwoba](https://www.linkedin.com/in/eloghosa-ikponmwoba) — [Google Scholar](#)

Professional Summary

PhD researcher with 4+ years of experience bridging AI, energy optimization, and public safety. Expertise in developing AI solutions for complex engineering systems and digital forensics applications. Proven ability to innovate at the intersection of machine learning, scientific computing, and societal impact. Currently focused on reinforcement learning for engineering design optimization, AI-powered tools for child protection, and contributing to INTERPOL's global law enforcement initiatives.

Education

Doctor of Philosophy in Mechanical Engineering **January 2022 – December 2026 (Expected)**

Louisiana State University, Louisiana, USA

Research Focus: Engineering Design Optimization with Artificial Intelligence

Bachelor of Engineering in Mechanical Engineering

November 2014 – December 2019

University of Benin, Benin City, Nigeria

Thesis: Numerical evaluation of nanofluid models under different heat and flow conditions

Professional Experience

Graduate Research Assistant

January 2022 — Present

Louisiana State University, Louisiana, USA

- **Reinforcement Learning-Accelerated Combustion Systems:** Worked on novel RL algorithms for adaptive CFD simulation control, achieving significant computational efficiency gains in combustion modeling. Developed intelligent solver parameter selection systems that reduce simulation time while maintaining solution accuracy for complex thermochemical processes.
- **DeepHive Optimization Framework:** Co-developed a multi-agent reinforcement learning system for automated discovery of swarm-based optimization policies targeting expensive black-box functions. Published methodology demonstrates superior performance on engineering optimization benchmarks with minimal function evaluations.
- **AI-Enhanced Scientific Computing:** Integrated machine learning approaches with OpenFOAM for combustion CFD simulations, creating adaptive workflows that intelligently adjust numerical methods based on real-time simulation states. Established foundations for next-generation AI-accelerated engineering simulation tools.
- **Interdisciplinary Research Impact:** Applied machine learning to enhance Raman spectroscopy analysis for cancer cell detection, demonstrating versatility in applying AI methodologies across diverse scientific domains while maintaining rigorous validation standards.

Summer Research Intern

May 2025 — August 2025

Halliburton Energy Services, Texas, USA

- **Advanced AI Framework Development:** Designed and implemented a Graph Neural Network-based reinforcement learning system for reservoir field development optimization. Achieved significant improvements in spatial decision-making capabilities compared to traditional optimization approaches.
- **Hybrid Simulation Architecture:** Engineered a scalable training environment integrating proprietary simulation tools with commercial reservoir modeling software. Enabled rapid prototyping while maintaining industry-standard validation protocols.
- **Economic Optimization Modeling:** Developed sophisticated multi-objective optimization frameworks incorporating complex economic variables for field development planning. Demonstrated measurable improvements in project economics through intelligent decision sequencing.
- **Production-Grade ML Pipeline:** Built robust machine learning infrastructure with comprehensive monitoring, automated evaluation, and deployment-ready architecture for real-world reservoir engineering applications.
- **Patent-Pending Innovation:** Filed patent application for novel deep reinforcement learning approach to generalizable oil and gas field development, representing breakthrough innovation in energy infrastructure optimization.

Machine Learning Engineer

April 2021 — August 2022

RIGR AI, Cork, Ireland

- **Assessing Risk Indicators of Child Sexual Abuse (ARICA):** Contributed to the development of AI-based adaptive scrapers for dark web forums supporting international law enforcement agencies in child protection investigations, directly contributing to global public safety and U.S. national security interests.

- **Government Contract AI Systems:** Engineered enterprise-grade semantic search engine processing millions of documents for U.S. government contracts using VESPA AI, enhancing government contractors operational efficiency and decision-making capabilities.
- **Advanced Text Summarization Platform:** Built scalable, serverless solution using AWS and Azure services with GPU-accelerated LLM models, demonstrating expertise in cloud-based AI infrastructure for critical applications.
- **Child Sexual Exploitation Detection:** Trained sophisticated deep learning models for detecting child sexual exploitation indicators in digital platforms, contributing to international child safety initiatives and law enforcement capabilities.

AI Researcher**November 2015 – September 2019**

Xigma Input and Output Technology, Benin City, Nigeria

- **Healthcare AI Innovation:** Co-founded innovative research startup developing AI applications across health, security, finance, and engineering sectors, demonstrating entrepreneurial leadership in technology innovation.
- **COVID-19 Detection Systems:** Trained machine learning algorithms for medical image screening, including COVID-19 detection using advanced CNNs during global health crisis, contributing to public health response capabilities.
- **AI Education Leadership:** Developed comprehensive machine learning curriculum for 200+ students, advancing AI education and workforce development in emerging technology sectors.

Research Assistant**March 2018 – December 2019**

Onyiriuka Lab, University of Benin, Nigeria

- Conducted numerical modeling for nanofluid heat transfer using ANSYS Fluent.
- Developed ML models for predicting nanofluid heat transfer coefficients.
- Published peer-reviewed research on nanofluid applications in heat transfer enhancement.

Peer-Reviewed Publications (Total Citations: 30+)

- **Ikponmwoba, E., & Owoyele, O. (2024).** "DeepHive: A multi-agent reinforcement learning approach for automated discovery of swarm-based optimization policies." *Algorithms*, 17(11), 500. **[Latest Publication]**
- **Ikponmwoba, E., et al. (2022).** "A Machine Learning Framework for Detecting COVID-19 Infection Using Surface-Enhanced Raman Scattering." *Biosensors*, 12(8), 589. **[18 citations - High Impact]**
- **Onyiriuka, E. J., & Ikponmwoba, E. A. (2019).** "A numerical investigation of mango leaves-water nanofluid under laminar flow regime." *Nigerian Journal of Technology*, 38(2), 348-354. **[11 citations]**
- **Levine, B., Kumar, J. J., Farid, H., Dixon, E., & Ikponmwoba, E. (2021).** "Indication of Child Sexual Abuse Revealed in App Store." *SOUPS 2022 Workshop on Kids' Online Privacy and Safety*. **[2 citations][Child Protection Research]**

Patent Applications

- **OIL AND GAS FIELD DEVELOPMENT PLANNING USING A DEEP REINFORCEMENT LEARNING APPROACH WITH RESERVOIR-INVARIANT TRANSFER LEARNING - U.S.** Patent Application Pending (2025) - Breakthrough innovation in energy infrastructure optimization

Awards & Recognition

- NASA Space Apps Challenge — Galactic Problem Solver (2020)
- APSA Science Challenge — Top 10 African Finalist, Ethiopia (2018)
- United Nations Academic Impact — Millennium Fellow (2018)
- Edo State/Siemens Energy Hackathon — Winner (2019)
- HULT Prize — Campus Champion & National Finalist (2017)
- Petroleum Trust Development Fund (PTDF) — Full Undergraduate Scholarship (2017-2019)

Professional Affiliations

- International Association of Engineers (IAENG) — Member
- Society of Petroleum Engineers (SPE) — Student Member
- American Physical Society (APS) - Member
- IEEE Computer Society — Member
- INTERPOL DevOps Community — Active Technical Contributor

Volunteer Experience

- INTERPOL DevOps Technical Working Group (2024 – Present)
- Crimes Against Children (CAC) Unit 14th DevOps Meeting — Arlington, VA (March 2025)

- 13th DevOps Meeting: Reading, UK (October 2024) - Developed machine learning solutions for children online safety

Editorial & Review Services

- **Applied Soft Computing** — Technical Reviewer
- **Journal of Emerging Investigators** — Technical Reviewer