KINGSLEY AZUKA OJEOGWU

Industrial AI Researcher | Digital Twins | Energy & E-Mobility Systems

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🔗 GitHub / Portfolio: https://github.com/FegElysium45/kingsleyojeogwu.github.io

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RESEARCH PROFILE

Industrial AI Researcher with 10+ years of experience at the intersection of **energy systems, embedded IoT, and applied machine learning**.
Specialized in building **autonomous digital twins** for power and e-mobility systems using **signal processing (FFT), reinforcement learning (RL), and containerized IoT architectures**.

Proven ability to translate **real-world customer and infrastructure problems** into **research prototypes, system requirements, and deployable AI pipelines**.
Experienced working independently in **Linux/Docker environments**, bridging research, engineering, and operations.

CORE RESEARCH INTERESTS

- AI-Driven Digital Twins for Energy & Mobility Systems
- Reinforcement Learning for Autonomous Control & Optimization
- Signal Processing (FFT, spectral analysis) for Predictive Maintenance
- Intelligent Agents for Industrial Systems
- Edge–Cloud AI Architectures (IoT, CAN, MQTT)

RESEARCH & PROJECT EXPERIENCE

AI Systems Architect & Independent Researcher

Autonomous Digital Twin for Power & EV Systems
Nov 2023 – Present

Led the research, architecture, and implementation of a **containerized industrial AI research platform** functioning as a high-fidelity digital twin for power and electric mobility systems.

Research Contributions

- Designed and implemented **FFT-based feature extraction pipelines** to convert noisy time-domain CAN and sensor data into frequency-domain health signatures for anomaly detection.
- Developed **Reinforcement Learning agents** (policy-based and value-based) to simulate autonomous grid and load optimization decisions inside a digital twin environment.
- Investigated **edge vs cloud AI partitioning**, executing FFT at the edge for latency and bandwidth reduction while training RL agents centrally.

System Architecture

- Dockerized Linux environment using **MQTT, Node-RED, InfluxDB, Grafana**
- Python-based FFT microservices and RL agents
- Closed-loop control via MQTT → CAN / actuator interfaces

Outcomes

- Demonstrated predictive maintenance capability detecting equipment degradation weeks ahead of failure.
- Validated feasibility of autonomous decision-making agents for industrial energy systems.
- Produced visual research outputs translating complex AI behavior into stakeholder-friendly dashboards.

AI Systems Architect & Technical Strategist

Predictive Maintenance as a Service (PdMaaS) — Illigo.mobi
2025

Authored and delivered a **Statement of Work (SOW)** defining the transition of Illigo's EV and charging infrastructure from reactive maintenance to **AI-driven Predictive Maintenance as a Service**

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Key Contributions

- Translated customer operational pain points into **system-level AI requirements**.
- Defined data acquisition strategies using **CAN reverse engineering**, IoT telemetry, and structured parsing pipelines.

- Designed a digital-twin-based roadmap aligning AI models with business KPIs.
- Acted as **technical interface** between engineering, digital teams, and leadership.

PROFESSIONAL EXPERIENCE (INDUSTRIAL CONTEXT)

Technical Lead – Energy, Electrical & IoT Automation

Clever Energy Solution (Nigeria & Egypt)
Aug 2024 – Present

- Led deployment of IoT-enabled monitoring systems for electromechanical and energy assets.
- Integrated sensors, actuators, and telemetry pipelines supporting data-driven diagnostics.
- Improved system uptime by ~20% through analytics-driven maintenance workflows.
- Produced technical documentation and performance reports for leadership and stakeholders.

Technical Operations Manager – Electrical & Automation

EliWills Limited
Sep 2018 – Aug 2024

- Oversaw automation and instrumentation projects across renewable and industrial energy systems.
- Managed multi-site operations, compliance, commissioning, and technical reporting.
- Collaborated with analytics teams to extract operational insight from field data.

EDUCATION & ADVANCED TRAINING

- **B.Sc. Energy & Petroleum Studies (2:1)** – Novena University
- **TensorFlow Developer Certificate** – DeepLearning.AI (**Google**)
- **AI / Machine Learning Fellowship (3MTT)** – Federal Ministry of Communications, Nigeria
- **Automotive Embedded Systems** – Starweaver
- **IBM Data Analytics**

- **IoT & Embedded Systems** – University of California, Irvine

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TECHNICAL SKILLS

AI & Research

- Reinforcement Learning (RL)
- Signal Processing (FFT, spectral analysis)
- Predictive Maintenance
- Intelligent Agents
- Time-Series Modeling

Systems & Deployment

- Docker & Linux
- MQTT, Node-RED
- InfluxDB, Grafana
- Python
- Git / GitHub

Domain Expertise

- Energy Systems & Power Infrastructure
- EV & Battery Systems
- CAN-Bus Telemetry
- Industrial IoT