Ayodeji Clement Akinola

Research Scientist & PhD Candidate | Systems, Energy and Sustainability

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English · German (B1) · Yoruba · Nigerian Pidgin

Systems Engineering · Energy & Process · Sustainability & LCA · Aviation · Batteries & Materials

Read my first-author research paper

PROFESSIONAL EXPERIENCE

Research Scientist & OpAL Project Owner
Oct 2023 - present

TU Braunschweig · Institute of Flight Guidance

Braunschweig, Germany

- Coordinated an eight-organisation research consortium. Set project milestones, assigned work packages and brought partners together for technical reviews and the final showcase.
- Built GHIST, a Python tool linking hydrogen supply costs to airport readiness and aircraft range. Screened 250 European airports and 8,825 historical directed connections in a research scenario.
- Developed an aircraft operating-cost model to compare conventional, hydrogen, electric and hybrid propulsion under common assumptions about energy, component life and utilisation.

Contract Researcher, Future Aviation R&D
Concurrent appointment

Boeing

Neu-Isenburg, Germany

- Develop the concept of operations, requirements and aircraft-ground interfaces for KORVI. Translate the needs of pilots, airlines and controllers into scenarios for coordinating flight paths and arrival times.
- Reviewed engineering assumptions for renewable methane and ammonia as aviation fuels in specialist research working groups.

Battery Systems Researcher
Apr - Oct 2023

BorgWarner Akasol · Cell Applications & Systems

Darmstadt, Germany · Master's thesis and working student role

- Built MATLAB workflows combining electrochemical impedance, incremental capacity and differential voltage analysis. Compared historical cell tests to assess how temperature and state of charge affected ageing in nickel-rich lithium-ion cells.

Materials & Project Engineering Intern
Jun - Oct 2022

Admantis Ltd.

Miskolc, Hungary

- Prepared and characterised lunar-regolith simulant and polyurethane composites. Interpreted laboratory results to compare formulations for space-materials research.

CORE SKILLS

Software & data

Python · MATLAB / Simulink · SQL · GeoPandas · Plotly / Dash · Excel / VBA

Energy & process

Hydrogen supply · Aspen HYSYS · PFDs / P&IDs · Process simulation

Sustainability & materials

openLCA · ecoinvent · Electrochemistry · Materials testing

Systems & aviation

ConOps · Requirements · Interfaces · Aircraft economics · Trade studies

Technical leadership

Work packages · Product ownership · Partner coordination · Supervision

PATENTS & RESEARCH

Filed inventions

Lead inventor on three filed patent applications in hydrogen and alternative propulsion.

Phosphorus recovery

Assessed the environmental impacts of phosphorus recovery from sewage-sludge ash with openLCA and ecoinvent.

Carbon electrodes

Made and tested carbon nanosheets from waste coconut for battery and supercapacitor electrodes.

EARLIER EXPERIENCE

Process Engineering Intern
2018 - 2019

DeltaAfrik Engineering / WorleyParsons

📍 *Lagos, Nigeria*

- Supported front-end design for industrial facilities. Used Aspen HYSYS, AutoCAD and Excel for process simulation, flow diagrams, piping and instrumentation drawings, and equipment sizing.

Founder, IT Services
2015 - 2020

TechLounge Computers

📍 *Nigeria*

- Founded an IT services business while studying engineering. Recruited and trained two employees and delivered data recovery, systems diagnostics and workflow automation.

EDUCATION

PhD candidate, Sustainable Aviation
TU Braunschweig · Institute of Flight Guidance

2023 - present

Two MSc degrees, Materials Science & Engineering
TU Darmstadt, Germany · University of Miskolc, Hungary

EIT AMIR double-degree programme · 2023

Diploma, Advanced Materials & Innovative Recycling
University of Bordeaux / EIT RawMaterials, France

2023

Bachelor's degree, Chemical Engineering
Obafemi Awolowo University, Ile-Ife, Nigeria

Second Class Upper Honours · 2019

PUBLICATIONS & PRESENTATIONS

First-author journal article · 2025
Akinola, A. C. et al. "Conceptual Feasibility Study of Integration of Aircraft With New Propulsion Technologies in Current Airline Flight Schedules." Aerospace Research Communications, vol. 3. In the modelled network, a 10% longer turnaround cut suitable hydrogen-turboprop routes from 20 to 15.

DOI 10.3389/arc.2025.14713

EASN International Conference · Toulouse, 2026
Presented separate studies on using GHIST to screen European flight networks and on estimating maintenance costs for alternative-propulsion aircraft.

Conference programme

HCI International · Montréal, 2026
Presented a method for checking human and technical prerequisites when assessing increasingly automated flight operations.

Conference programme

AWARDS & RECOGNITION

🏆 Tapojärvi Innovation Challenge
Co-led Innovative IQ to third place in 2023. The team prototyped a 3D-printing feedstock concept using steel slag and fly ash.

TU Darmstadt team profile

👑 Space Generation Advisory Council
Volunteer in career liaison and outreach, supporting the council's career-development work.

TEACHING & SUPERVISION

🎓 Sustainability in Aviation
Teach sustainable aviation fuel (SAF), life-cycle assessment and fleet planning as part of the Sustainability in Aviation course at TU Braunschweig.

👥 Research supervision
Supervised or co-supervised 13+ academic and engineering projects in Germany and Singapore, including work on route feasibility, ground operations and AI-based decision support.

SELECTED PROJECTS

🔧 Chemical process design
Led a university team modelling a chlorobenzene plant in Aspen HYSYS. Connected process design decisions with material and energy balances.

🔧 TurnGREEN
Co-supervised a student team that developed a visualisation tool for airport turnaround activities and the ground time they require.

⛽ Renewable fuels
Studied the production of biodiesel from waste castor seed oil as a university research project.