ADEKOLA B. ADEYEMI

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ENGINEERING PROFILE

Mechanical engineering PhD candidate specializing in compressible CFD and turbomachinery aerodynamics. Experience extending body force models, developing mesh generation tools, and automating aerodynamic analysis using Python and OpenFOAM. Research includes transonic fan modeling and an ongoing aircraft aerodynamics project using the NASA Common Research Model. Canadian permanent resident; PhD completion expected December 2026.

RELEVANT TECHNICAL SKILLS

- Compressible flows, multiphase flows, transonic turbomachinery, body force modeling
- CFD: OpenFOAM, Ansys Fluent, Ansys CFX,
- Mesh generation: Ansys TurboGrid, Pointwise, OpenFOAM blockMesh, Salome
- Programming and analysis: Python, MATLAB, LaTex
- CAD: SolidWorks, Autodesk Inventor
- Internal and external flows aerodynamics; turbomachinery

RESEARCH AND ENGINEERING EXPERIENCE

Doctoral Researcher

Turbomachinery and Unsteady Flow Research Group, University of Windsor | 2021 - Present

- Modeled transonic axial turbomachinery with nonuniform inlet flow using OpenFOAM; assessed aerodynamic performance, efficiency penalties, unsteady rotor loading
- Reformulated selected body force model equations to support aperiodic blade rows and implemented the models in OpenFOAM
- Develop Python workflows to process simulation outputs and compare aerodynamic performance across parametric design studies
- Completed 2,000 CFD cases evaluating non-axisymmetric stator designs and constructed a Pareto front to identify trade-offs between aerodynamic efficiency and unsteady rotor loading.
- Presented research at ASME Turbo Expo 2026 in Milan, Italy

Sustainable Aviation Research Project

Turbomachinery and Unsteady Flow Research Group, University of Windsor | 2023 – Present

- Created a Pointwise mesh of the NASA Common Research Model and exported it to OpenFOAM for external aerodynamic analysis
- Preparing baseline OpenFOAM simulations of the NASA Common Research Model for an ongoing study of distributed propulsion using sustainable aviation fuel.

APT-Grid Developer and Researcher

Turbomachinery and Unsteady Flow Research Group, University of Windsor | 2025 – 2026

- Developed APT-Grid using Python and OpenFOAM blockMesh to generate OH-type meshes for periodic and aperiodic turbomachinery blade rows, ensuring geometrically matching boundaries and conformal mesh points between differing blade geometries.
- Assessed periodic IGV and ECL5 stator meshes against Ansys TurboGrid using grid independence studies, span-wise loss coefficient, and outflow swirl angle in compressible simulations using OpenFOAM.
- Demonstrated a full-wheel aperiodic IGV mesh and flow solution and compared it with a previously published body force solution. Research manuscript completed; publication pending

Subsea Engineer
MSCM-PPNL Subsea Solutions Nigeria Ltd | 2019 - 2021

- Designed an interface rig using the company's existing stab plates as design references and reviewed the Functional Design Specification with the engineering team
- Completed facility training in the United Kingdom on rotating equipment troubleshooting and turbomachinery operating principles

Postgraduate Engineering Intern
Shell Nigeria Exploration and Production Company | 2018

- Analyzed metering system data to compare options for redundancy in flow computers; the process automation team implemented the recommended approach
- Analyzed 2012 – 2018 produced water treatment data with the process and flow assurance team; the resulting recommendation was considered for turnaround maintenance
- Used Ansys structural design for an impact loading analysis of an FPSO hull and visited the Bonga FPSO to understand its operating context

Graduate Research Assistant
Federal University of Petroleum Resources Effurun | 2015 – 2017

- Led the team that designed and fabricated a one tonne utility vehicle and coordinated with faculty, researchers and workshop technologists
- Used SolidWorks to model a hovercraft and Ansys Fluent to analyze the flow around the airfoil to improve the airfoil design

EDUCATION

PhD in Mechanical Engineering | Expected December 2026
Turbomachinery and unsteady flow research group, University of Windsor.

MSc in Offshore Engineering | Feb 2019
Offshore Technology Institute, University of Port-Harcourt

BEng in Production Engineering | May 2015
University of Benin, Benin City, Edo State.

PUBLICATIONS

- Adeyemi, A., George, A., and Defoe, J. (2026). "An OpenFOAM-Based Implementation of Modern Body Force Models for Fans and Compressors Including Support for Aperiodic Blade Rows." Proceedings of ASME Turbo Expo 2026, Milan, Italy. Paper GT2026-179240.
- George, A., **Adeyemi, A.**, and Defoe, J. (2026). "Aerodynamic Design and Performance Prediction for a Low-Speed Fan Analogous to a Transonic Fan." *Proceedings of ASME Turbo Expo 2026*, Milan, Italy. Paper GT2026-178969.

AWARDS AND RECOGNITION

- Best graduating student, Offshore Engineering (OTI, UNIPORT)
- TechnipFMC Scholarship Award for Master's Degree
- Member, Ontario Society of Professional Engineers (OSPE)

LANGUAGES

- English Language Proficiency (IELTS Band Score 8.5)
- French Language Proficiency (Beginner – A2)