Ayomide D. Osetoba

PhD Student, Mechanical Engineering, University of Manitoba · Winnipeg, Manitoba, Canada
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PROFILE

PhD student in Mechanical Engineering developing physics-informed machine learning for predictive modelling, state estimation, and intelligent control of agricultural machinery working processes, in partnership with MacDon Industries Ltd. Research grounded in vibration-based condition monitoring of rolling element bearings, uncertainty quantification, and signal processing, with a first-author conference paper and a co-authored journal manuscript under revision. Sustained record of teaching, tutoring, and mentoring engineering students across Nigeria, South Africa, and Canada, alongside continuing community service and student leadership.

EDUCATION

PhD, Mechanical Engineering **Jan 2026 – present**
University of Manitoba *Winnipeg, Canada*

- Research: physics-informed machine learning for predictive modelling, state estimation, and intelligent control of agricultural machinery working processes; industry partner MacDon Industries Ltd.
- Supervisor: Prof. Nariman Sepehri, Fluid Power and Telerobotics Research Laboratory.
- GPA 4.50/4.50 (Winter 2026): A+ in Theory of Vibrations and in MECG 7780 Techniques for Condition Monitoring and Maintenance.

MSc (Applied Science): Mechanics **Sep 2023 – Nov 2025**
Department of Mechanical and Aeronautical Engineering, University of Pretoria *Pretoria, South Africa*

- Grade: 80% (pass with distinction). Fully funded by the Mastercard Foundation Scholars Program.
- Dissertation: *A Framework Towards Quantifying Aleatoric and Epistemic Uncertainties in Rolling Element Bearing Condition Monitoring Experiments*, completed within C-AIM, the Centre for Asset Integrity Management.
- Supervisors: Prof. Daniel Nico Wilke, Dr Stephan Schmidt.

BScHons (Applied Science): Mechanics **Jan 2022 – Dec 2022**
Department of Mechanical and Aeronautical Engineering, University of Pretoria *Pretoria, South Africa*

- Thesis: *Agricultural Tyres Interaction with Soil.* Supervisor: Prof. Schalk Els.

BEng, Agricultural and Bioresources Engineering **Nov 2014 – Jan 2020**
Federal University Oye-Ekiti *Oye-Ekiti, Nigeria*

- First Class Honours; Grade: 4.5/5.0. Best Graduating Student in the department.
- Thesis: *Development of a Reciprocating Weeding Machine for Commodity Crop Production*, supported by TETFund. Supervisor: Prof. Folasayo Fayose.

RESEARCH & PROFESSIONAL EXPERIENCE

STEM Expert (AI Evaluation) **May – Aug 2026**
Turing *Remote*

- Evaluated AI model responses to graduate-level STEM problems for technical accuracy and rigour, and assessed prompt and response quality in computational mechanics and engineering.

- Designed and reviewed verifier tasks, contributing domain expertise in bearing diagnostics, vibration signal processing, and machine learning in mechanics.

Research Assistant, Solar Thermal Project **Oct 2023 – Feb 2024**
Department of Mechanical and Aeronautical Engineering, University of Pretoria *Pretoria, South Africa*

- Conducted experiments, logged measurements, and curated experimental datasets for downstream analysis.
- Analysed time-series measurements in Python and MATLAB to evaluate system performance.
- Built Python data-quality checks (missing steps, time gaps, abnormal durations and outliers), improving log validity and dataset reliability before archiving.

Engineering Intern **Jun – Dec 2018**
Afe Babalola University Farm *Ado-Ekiti, Nigeria*

- Operated and maintained agricultural machinery, including tractors and milling equipment, and assisted with poultry and fish feed formulation.
- Maintained operating logs and maintenance schedules with close attention to workplace safety.

PUBLICATIONS

1. **A. D. Osetoba**, S. Schmidt, D. N. Wilke. "Estimating epistemic and aleatoric uncertainties in experimental rolling element bearing condition monitoring data." *Proceedings of the 14th South African Conference on Computational and Applied Mechanics (SACAM 2025)*, Johannesburg, South Africa, 21–23 January 2025, pp. 275–280. ISBN 979-8-3313-3299-0. **First author and presenter.**
2. D. N. Wilke, **A. D. Osetoba**, S. Schmidt. "Signal-dependent performance of envelope extraction methods." *Results in Engineering* (Elsevier), under revision. **Second author.**
3. F. Fayose, A. Olaniyan, **A. D. Osetoba**, K. Ogunleye, O. Ilesanmi. "Development of a reciprocating weeding machine for commodity crop production." *LASU Journal of Engineering, Science and Technology* 3(1), pp. 5–20, 2021. **Third author.**

Dissertation

A. D. Osetoba. *A Framework Towards Quantifying Aleatoric and Epistemic Uncertainties in Rolling Element Bearing Condition Monitoring Experiments.* MSc dissertation, University of Pretoria, 2025. hdl.handle.net/2263/107207

AWARDS & SCHOLARSHIPS

Mastercard Foundation Scholars Program: full postgraduate funding, University of Pretoria 2022 – 2025
Best Graduating Student, Agricultural and Bioresources Engineering, FUOYE 2020

TEACHING EXPERIENCE

Teaching Assistant and Grader, MECH 3482 Kinematics and Dynamics **Jan – Apr 2026**
Department of Mechanical Engineering, University of Manitoba *Winnipeg, Canada*

- Assessed undergraduate coursework and assignments with detailed, constructive feedback, working with course coordinators to keep marking consistent across a large cohort.
- Identified recurring learning gaps during grading and communicated them to lecturers to inform tutorial content.

Teaching Assistant, MSY310 Structural Mechanics **Mar 2024 – Sep 2025**
Department of Mechanical and Aeronautical Engineering, University of Pretoria *Pretoria, South Africa*

- Delivered tutorials and practicals for this third-year course in structural mechanics and simulation-based design; developed and evaluated MATLAB and Python assignments reinforcing practical programming skills.
- Performed quality assurance against marking rubrics and standardised marking decisions on edge cases, improving grading accuracy and consistency.

Senior Mathematics and Physics Tutor **Nov 2023 – Aug 2025**
University of Pretoria Pre-University Academy *Pretoria, South Africa*

- Delivered structured tutorials strengthening conceptual understanding, problem-solving, and exam readiness for STEM programmes.
- Provided academic mentoring and individualised support to students from diverse backgrounds.

Assistant Lecturer (NYSC) **Apr 2020 – Feb 2021**
College of Agriculture, Science and Technology *Lafia, Nigeria*

- Lectured Applied Mechanics, Fluid Mechanics, Thermodynamics, and Engineering Mathematics; facilitated practical sessions, prepared assessments, and provided feedback.
- Supported departmental administration and student consultation.

Peer Tutor, Undergraduate Engineering Courses **Nov 2017 – Jan 2020**
Federal University Oye-Ekiti *Oye-Ekiti, Nigeria*

- Provided peer tutoring and created study notes and worked examples for core engineering courses.

MENTORSHIP, LEADERSHIP & COMMUNITY SERVICE

Mentor, Design and Innovation Challenges **2026**
African Leadership Academy *Remote*

- Mentored student teams through prototyping, technical refinement, and pitch preparation in two challenges: Infrastructure, Climate Change and Human Mobility (with the International Organization for Migration) and Responsible Gold, Inclusive Futures (with the World Gold Council).

Undergraduate Robotics Mentor, University of Manitoba: supported a student in preparing a laboratory robot for technical demonstration. Aug 2026

Food Bank and Church Community Volunteer, Winnipeg: Saturday-morning food bank shifts and church-organised outreach. 2026 – present

Engineering Mentor, Chevron Engineering Leadership Programme **Jun – Jul 2024**
African Leadership Academy *Johannesburg, South Africa*

- Guided student teams through structured innovation cycles (problem definition, ideation, rapid prototyping, and iteration), emphasising evidence-based decisions and inclusive teamwork.
- Built lightweight Python reporting (tables and plots) to compare ideas against evidence criteria, enabling faster and clearer decision-making.

Community Engagement, Mastercard Foundation Scholars Program, University of Pretoria: community service and give-back activities. 2022 – 2025

President, NYSC HIV/AIDS Community Development Service, Lafia: led a group delivering HIV/AIDS awareness and education in the host community. 2020 – 2021

Acting Financial Secretary, Student Union Government, Federal University Oye-Ekiti 2019/2020

President, Nigerian Universities Engineering Students' Association (NUESA) **Nov 2018 – Dec 2019**
FUOYE Chapter, Federal University Oye-Ekiti *Oye-Ekiti, Nigeria*

- Led and organised academic and social activities connecting engineering students across programmes.
- Created opportunities for practical engagement and professional networking.

Member, Student Representative Council, Federal University Oye-Ekiti 2018 – 2019

SOFTWARE

CutePDF (ayomideosetoba.github.io/CutePDF): a browser-based tool for annotating and highlighting research PDFs, including scanned two-column papers. Files are processed in the browser and never uploaded.

TECHNICAL SKILLS

- **Dynamics and control:** kinematic modelling, multibody dynamics, state estimation, vibration analysis.
- **Signal processing and diagnostics:** envelope analysis, spectral kurtosis, fast kurtogram, time-series analysis, vibration-based condition monitoring.
- **Machine learning:** regression, classification, cross-validation, model evaluation; physics-informed modelling.
- **Uncertainty quantification:** Bayesian methods, evidential deep learning, separation of aleatoric and epistemic uncertainty.
- **Modelling and simulation:** MATLAB, Simulink, Simscape Multibody, ADAMS, SolidWorks, FreeCAD.
- **Computing and practice:** Python (NumPy, SciPy, scikit-learn, PyTorch, pandas, matplotlib, Jupyter), Octave, Git and GitHub, LaTeX; experimental data curation and automated data-quality checks.

CERTIFICATIONS

- National Youth Service Corps (NYSC), Nigeria: Certificate of National Service (2021).
- Chartered Institute of Environmental Health and Safety, USA: Certified HSE Levels 1, 2, and 3.
- WHMIS, University of Manitoba.
- Career Essentials in Generative AI; Career Essentials in Software Development (Microsoft and LinkedIn); Professional Soft Skills Learning Pathway (LinkedIn).

PROFESSIONAL MEMBERSHIPS

Graduate Member, Nigerian Society of Engineers (NSE) 2022 – present
Associate Member, Chartered Institute of Environmental Health and Safety, USA 2021 – present
Student Member, Nigerian Society of Engineers (NSE) 2016 – 2020

LANGUAGES

English, Yoruba.