Luyando Kwenda

+1-210-993-1103 | luyandokwenda@gmail.com | linkedin.com/in/lkwenda | lkwenda.github.io/website

EDUCATION

University of Pennsylvania — May 2024
BSE and MSE in Mechanical Engineering and Applied Mechanics — *GPA: 3.79/4.0 (BSE), 3.71/4.0 (MSE)*
Relevant Coursework: Aerodynamics, Viscous Fluid Flow, Heat and Mass Transfer, Thermodynamics, Mechanical Design, Feedback and Control Systems, Numerical Methods, Hovering Vehicle Design, Failure Analysis of Engineering Materials.

TECHNICAL SKILLS

Software: CFD, FEA, ANSYS, SolidWorks, Cadence Fidelity, AutoCAD, OnShape, Simulink, MATLAB, Python, C#, Visual Studio, Git

Manufacturing: CNC Milling, GD&T, Mastercam, Lathe, 3D Printing, Laser Cutting

EXPERIENCE

Automation Development Intern — June 2025 — Present
SolidWorks Automation Team, Dassault Systèmes — *Waltham, MA*
- Perform QA automation testing on large SolidWorks CAD datasets, analyzing and preparing test suites in C# and SolidWorks API to validate geometry kernel updates and improve test reliability.
- Repair and optimize 3D CAD models; design methods and tooling in Visual Studio to extract CAD metadata for building robust test suites for future updates
- Enhance the automation framework to streamline bug detection and failure analysis in collaboration with developers to deploy and refine internal automation tools.

Mechanical Engineering Research Assistant — Nov. 2024 — May 2025
Penn Complex Fluids Lab, University of Pennsylvania — *Philadelphia, PA*
- Research CFD methods for a kirigami-based fog collector, analysing flow behaviour and water collection efficiency.
- Review and implement turbulence modeling techniques to improve simulation accuracy and capture complex flow interactions.

Mechanical Engineering Research Assistant — Feb. 2021 — May 2023
Sung Robotics Lab, University of Pennsylvania — *Philadelphia, PA*
- Debugged and refined the Build-a-Bot robotics program in C++, C#, and XAML with a 5-member team, improving UI usability and creating a step-by-step work instruction guide for a user study.
- Characterization and mechanical testing on bistable gripper using MTS Universal Testing Machine, analyzing spring deformation data and energy efficiency.
- Developed and validated structural models in SolidWorks and ANSYS to optimize the design for minimal energy input, reducing energy requirements by over 50%.
- Used numerical methods in MATLAB and Mathematica to solve differential models for system analysis and optimization.

Student Assistant — Jan. 2022 — Feb. 2024
Rapid Prototyping Lab, University of Pennsylvania — *Philadelphia, PA*
- Led prototyping and design refinement for 3D printing and laser cutting projects, focusing on manufacturability and optimizing lab workflows to enhance efficiency by 25%.

Teaching Assistant - Thermodynamics & Physics — Jan. 2023 — May 2024
University of Pennsylvania — *Philadelphia, PA*
- Led weekly analytical exercises and lab sessions for 30+ students, improving pass rates to 97% in Thermodynamics and 100% in Physics; provided detailed feedback on lab reports and assignments to enhance understanding of core principles.

PROJECTS

Actuated, Retractable Hydrofoil Boat (Senior Design Project) — Aug. 2023 – May. 2024
- Designed and optimized a high-performance retractable hydrofoil mechanism, increasing energy efficiency by 80% at transition speeds.
- Implemented rigorous testing protocols and stress analysis, which validated design concepts and enhanced hydrofoil performance by more than 60%, ensuring project milestones were met ahead of schedule.

Cadence + McLaren F1 Team CFD Student Challenge — Oct. 2023 – April 2024
- Conducted CFD simulations using Cadence Fidelity software to analyze front wing aerodynamics of a Formula 1 car, optimizing the downforce-to-drag ratio within a 7-million cell count constraint; selected as a **top 4 finalist nationwide**.

Sterling Engine — Jan. 2022 – May 2022
- Conceptualized a Gamma-type Stirling engine using 3D CAD modeling in SolidWorks with GD&T constraints for nearly 100% machining accuracy; fabricated components using Mastercam, CNC mill and lathe, earning **second place** at 1888 RPM in the final competition.