

ABEIKU DARKWA

• 437-218-8504 • akdarkwa@uwaterloo.ca • akdcreates.com • linkedin.com/in/abeikudarkwa

EDUCATION

The University of Waterloo

Bachelor of Applied Science, Mechanical Engineering (Junior year)

Waterloo, ON

Expected Graduation: 2027

Relevant Courses: Mechanics of Solids, Material Properties, Electromechanical Devices, Mechanical Design, Thermodynamics

SKILLS

CAD: SOLIDWORKS, AutoCAD, Onshape, Creo, Inventor, Fusion 360, FEA, Motion Studies

Mechanical: 3D Printing, Laser Cutting, CNC Machining, Root Cause Analysis, GD&T, FMEA, Risk Analysis, DFMA, Optical Design

Electrical and Software: C/C++, MATLAB, Arduino, Soldering, Git, Python

EXPERIENCE

Optical Systems Engineering Intern

Waterloo, ON

Institute for Quantum Computing

September 2024 – December 2024

- Designed 4 optical reference boards for the development of a quantum computer's ion position tracking system by utilizing Gaussian beam theory, LightFlow Optics, and SOLIDWORKS.
- Created 4 bracket assemblies for precise reference board mounting using SOLIDWORKS and Inventor.
- Characterized an optical position sensor for reference board development by utilizing Python for real time data acquisition and MATLAB for data analysis and plot generation.
- Developed a 3D printed soldering jig to populate a mock PCB used for electrical testing of a critical ZIF socket.

Mechatronics Product Design Intern

Waterloo, ON

Sienci Labs

January 2024 – April 2024

- Designed and prototyped a laser-diode magnetic mount attachment utilizing SOLIDWORKS and 3D printing, projected to increase sales by **10%**, generating **\$1500** a month.
- Supported CO2 laser development by integrating and calibrating micro controllers, stepper motors, and sensors.
- Fabricated enclosure panels using CNC machining to aid in the development and testing of the CO2 laser prototype.
- Produced a 50-page SOP for a laser beam system to reduce user tickets and support customer requests.

Mechanical Project Lead

Waterloo, ON

Electrium Mobility

January 2024 – May 2024

- Optimized scooter frame geometry and material selection, resulting in an **8%** weight reduction in the design.
- Manufactured several build components using manual and CNC machining in conjunction with 3D printing.
- Conducted FEA studies on the deck using SOLIDWORKS SIM to validate safety metrics.
- Produced a BOM using Excel, coordinating key purchases with team members to reduce spending by **40%**.

Mechanical Test and Validation Engineering Intern

Ayr, ON

Bend All Automotive

May 2023 – August 2023

- Performed 150+ standardized tests on 2500+ parts to ensure long-term safety compliance standards.
- Completed design validation on transmission and engine oil coolers to ensure OEM specifications were met.
- Collected test data and formulated reports using Excel, resulting in accurate part failure analysis.

PROJECTS (For Detailed Overview – [Portfolio](#))

THE DREAMMAKER | SOLIDWORKS, Robotics, Mechanical Design, MATLAB, 3D Printing,

- Developed a 3D printed cycloidal drive for robotic applications.
- The design boasts a torque output efficiency of **52%**, an excellent rating for 3D printed reducers.

Drone Design Challenge | SOLIDWORKS, Product Design, 3D Printing

- Created an electronic enclosure and landing gear for a drone, meeting strict design requirements in the process.
- The landing gear was designed to possess exceptional structural integrity while retaining a mass of only **491.6** grams.

Heat Transfer Model | Arduino, Python, MATLAB, Mathematical Modelling

- Developed a differential equation-based model to analyze heat transfer in vegetables.
- Utilized an Arduino, DS18B20 temperature probe, and a python script for data acquisition to construct the model.