University of Waterloo

Co-operative Work Terms

Olalekan Ashadele
21120957
1B Electrical Engineering, Honours, Co-operative Program

Work Term	Employer	Evaluation
Jan - Apr 2025	Advanced Technology Labs	OUTSTANDING
	Divisional Office	
	London Ontario Canada	
	Software Engineering Intern	

Planned Future Work Term(s)
Sep - Dec 2025
May - Aug 2026
Jan - Apr 2027
Jan - Apr 2028
Sep - Dec 2028

Olalekan Ashadele

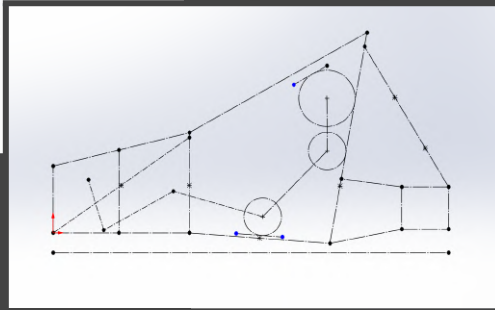osashade@uwaterloo.ca — (825) 454-9233

FSAE CHASSIS

SOLIDWORKS, Finite Element Analysis

Designed a Formula SAE space frame chassis from first principles within a one-week deadline, focusing on a hands-on understanding of load paths for critical impact scenarios.
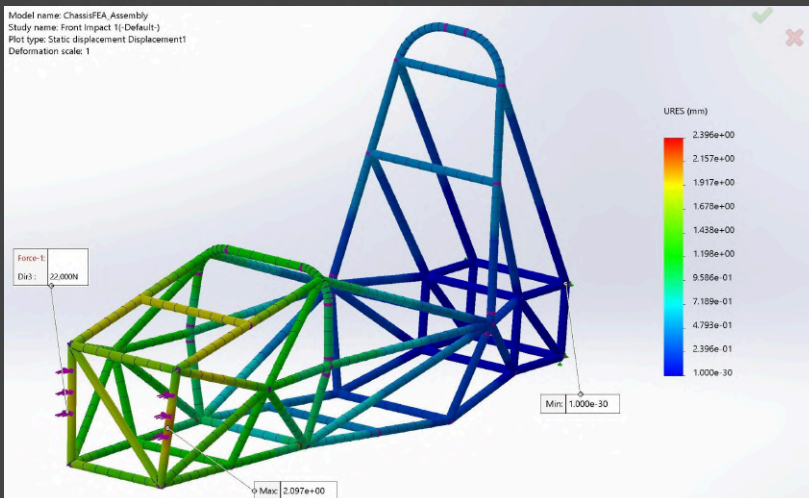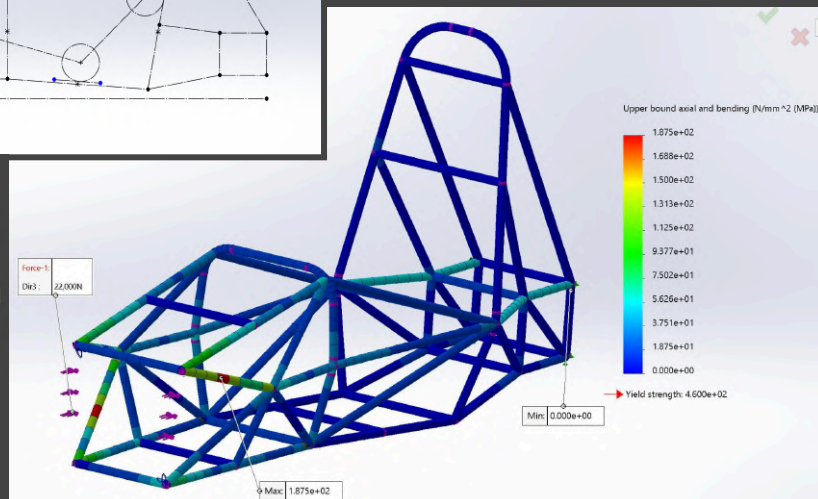
- Selected materials based on yield strength to ensure safety and durability under expected forces.

- Developed the chassis geometry using truss concepts and carefully calculated supported lengths to optimize stiffness and weight.

- Applied FSAE rule constraints and driver ergonomics to meet packaging, safety, and comfort requirements.

- Balanced manufacturability and accessibility in the design to support realistic fabrication processes.

- Challenged myself to sharpen design skills under time pressure and refined my ability to work effectively within strict engineering and regulatory constraints.

Performed finite element analysis (FEA) on the FSAE chassis, completing the front impact test case as specified by FSAE rules. Using SolidWorks Simulation, to apply a 22,000 N frontal impact force and observed minimal displacement. Material stresses stayed below yield strength, confirming structural integrity under impact.

Highlights:

- Front impact test case completed per FSAE requirements
- Simulated 22,000 N frontal force in SolidWorks
- Minimal chassis deformation observed
- Materials remained within elastic limits
- Force calculations based on empirical and kinematic formulas

PARAMETER	VALUE
Initial Velocity	85 km/h = 23.61 m/s
Final Velocity	0 m/s
Mass (Driver + Car)	230 + 60 = 290 kg
Stopping Time (Assumed)	0.325 s

Calculations

The total force was calculated using the following formulae:

- Final velocity = initial velocity + a * t
- $0 = 23.61 + a * 0.325$
- Acceleration = -23.61 / 0.325
- Acceleration = -72.646 m/s^2

- Total force acting on the body = 290 * (-72.646) N
- Total force acting on the body = -21,067 N (negative Z direction)

22, 000 N was chosen to account for variations in mass or speed.

Olalekan Ashadele

osashade@uwaterloo.ca — (825) 454-9233

Electrium RC Case

SOLIDWORKS, Rapid Prototyping, PCB Packaging

As part of a cross-functional team, I designed an RC enclosure to support two different PCB layouts. The project emphasized adaptability and precision, requiring close coordination with both Hardware and Firmware teams. I applied Design for Manufacturing (DFM) principles throughout, optimizing the design for ease of assembly and production. Over the span of two weeks, I used rapid 3D printing to prototype and evaluate 8 design iterations, incorporating feedback at each stage.

Key features of the design included:

- Snap-fit clips for securing a compact LCD display, using manufacturer datasheets for accurate fit

- Threaded insert mounts for joining enclosure halves securely

- Internal recesses to house a 1-axis joystick, designed to interface with a ridged throttle wheel offering ~45° of rotation

By iterating quickly and adapting to changing specifications, I helped ensure the mechanical design integrated seamlessly with the electrical and firmware components. This project served as an excellent base for future projects involving several engineering disciplines.

Olalekan Ashadele

osashade@uwaterloo.ca
linkedin.com/in/olalekanashadele

Education

University of Waterloo - Bachelor of Applied Science   Expected Graduation 2029

Skills

- **CAD/Software :** SolidWorks, Ansys, AutoCAD, Fusion 360, Quartus Prime, PrusaSlicer
- **Tools/Languages:** C/C++, SystemVerilog, VHDL, Python, MATLAB
- **Prototyping:** 3D Printing, Machining, CNC, Woodworking, Laser Cutting

Experience

Mechanical Engineer – Midnight Sun   March 2025 – Current
- Supported late-stage preliminary design of the Midnight Sun MSXVI chassis and internal structures through component placement and CAD modeling in SolidWorks.
- Performed Finite Element Analysis (FEA) on chassis, evaluating stress distribution, deformation, and factor of safety under static loads, including crash test simulations as mandated by ASC and FSGP regulations
- Refined mechanical components of the chassis using FEA-informed insights in SolidWorks, applying targeted changes to enhance stiffness, reduce localized stress, and improve overall structural performance

Mechanical Design Engineer - Electrium Mobility   January 2025 - Current
- Designed a compact, ergonomic remote control enclosure in SolidWorks, optimizing internal component layout and user experience.
- Utilized rapid prototyping techniques including 3D printing to iterate enclosure design, reducing development time and improving functionality.
- Supported cross-functional build efforts by machining custom parts for electric mobility projects, including an extended-frame e-bike (Longtail) and an electric go-kart.
- Applied DFM/DFA principles to improve manufacturability and assembly of prototype components.
- Collaborated closely with electrical and software teams to ensure mechanical designs met technical requirements and integration constraints.

Projects

Formula SAE Chassis Design   May 2025
- Designed a full Formula SAE space frame chassis in SolidWorks, adhering to FSAE rules and packaging constraints including driver ergonomics, safety regulations, and component integration
- Conducted FEA using SolidWorks Simulation to evaluate structural integrity under critical load cases.
- Validated chassis design to withstand forces exceeding 20,000 N without yielding, demonstrating compliance with safety requirements and robust structural performance.

Sequential Transmission Drivetrain   May 2025 – Current
- Designing a 5-speed sequential transmission system in SolidWorks for a RWD FSAE vehicle, with integration into full chassis assembly.
- Modeled key drivetrain components including splined (DIN 5472) input shaft, selector drum, shift forks, dog clutches, and clutch mechanism.
- Performed torque-based shaft sizing using mechanical design formulas, factoring in maximum expected torque, material shear strength, and safety factors to ensure structural reliability.
- Included differential and rear axle assembly, optimizing packaging within chassis constraints and focusing on functionality, serviceability, and manufacturability.

UNIVERSITY OF WATERLOO
UNOFFICIAL GRADE REPORT

Olalekan Ashadele
21120957

1B Electrical Engineering, Honours, Co-operative Program

Fall 2025

PD	20	Strategies for Career Success	

Term Average: N/A Decision:

Spring 2025

ECE	124	Digital Circuits & Systems	
ECE	140	Linear Circuits	
ECE	192	Eng Economics & Society Impact	
GENE	120	First-Year Eng Seminar	
ECE	102	Information Session	
ECE	108	Discrete Math & Logic 1	
MATH	119	Calculus 2 (Eng)	
ECE	106	Electricity & Magnetism	

Term Average: N/A Decision:

Winter 2025

COOP	1	Co-operative Work Term	CR
PD	19	Tactics for Workplace Success	CR

Term Average: N/A Decision:

Fall 2024

MATH	117	Calculus 1 (Eng)	97
ECE	150	Fundamentals of Programming	94
MATH	115	Linear Algebra (Eng)	92
ECE	105	Classical Mechanics	82
ENGL	192	Eng Comm (COMPE/ELE/MGTE)	91
ECE	190	Eng Profession & Practice	92
GENE	119	First-Year Engineering Seminar	
ECE	198	Project Studio	85
MTHEL	99	First-Year Math Readiness	CR

Term Average: 90.75 Decision: Excellent Standing

Olalekan Ashadele
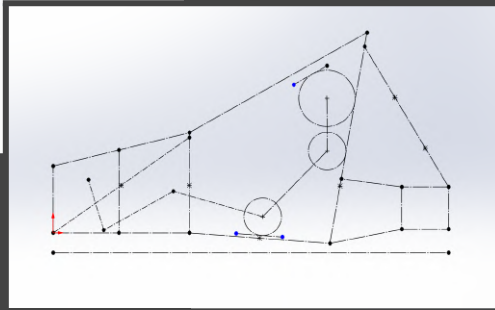osashade@uwaterloo.ca — (825) 454-9233

FSAE CHASSIS

SOLIDWORKS, Finite Element Analysis

Designed a Formula SAE space frame chassis from first principles within a one-week deadline, focusing on a hands-on understanding of load paths for critical impact scenarios.
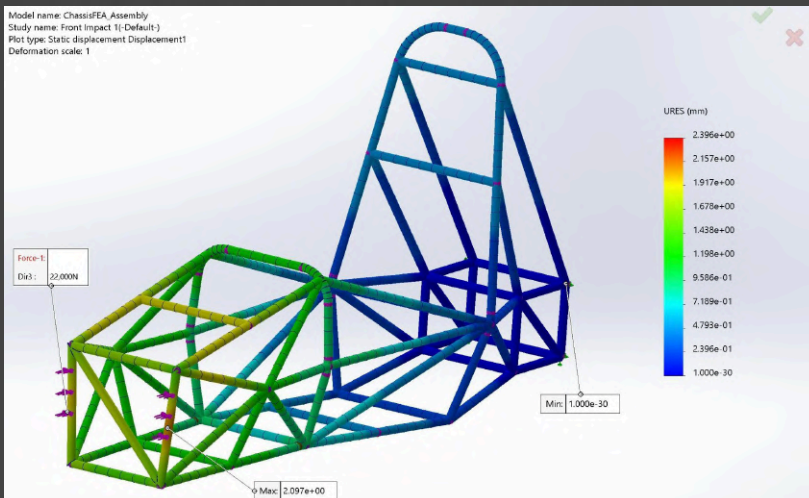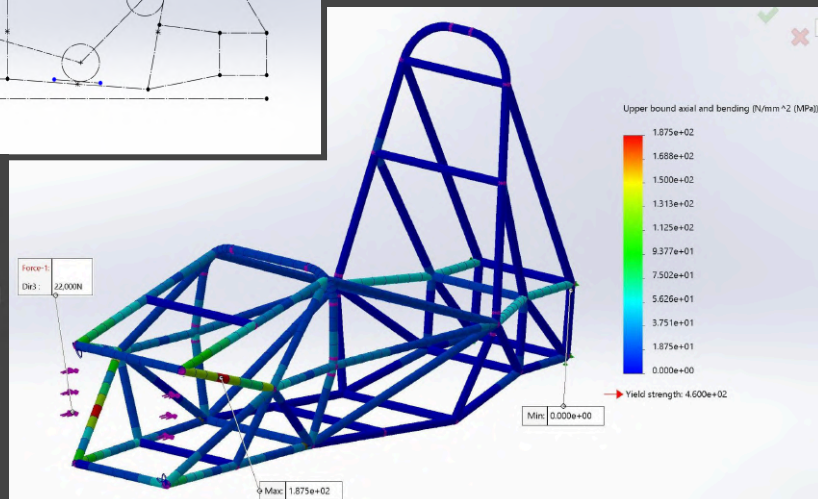
- Selected materials based on yield strength to ensure safety and durability under expected forces.
- Developed the chassis geometry using truss concepts and carefully calculated supported lengths to optimize stiffness and weight.
- Applied FSAE rule constraints and driver ergonomics to meet packaging, safety, and comfort requirements.
- Balanced manufacturability and accessibility in the design to support realistic fabrication processes.
- Challenged myself to sharpen design skills under time pressure and refined my ability to work effectively within strict engineering and regulatory constraints.

Performed finite element analysis (FEA) on the FSAE chassis, completing the front impact test case as specified by FSAE rules. Using SolidWorks Simulation, to apply a 22,000 N frontal impact force and observed minimal displacement. Material stresses stayed below yield strength, confirming structural integrity under impact.

Highlights:

- Front impact test case completed per FSAE requirements
- Simulated 22,000 N frontal force in SolidWorks
- Minimal chassis deformation observed
- Materials remained within elastic limits
- Force calculations based on empirical and kinematic formulas

PARAMETER	VALUE
Initial Velocity	85 km/h = 23.61 m/s
Final Velocity	0 m/s
Mass (Driver + Car)	230 + 60 = 290 kg
Stopping Time (Assumed)	0.325 s

Calculations
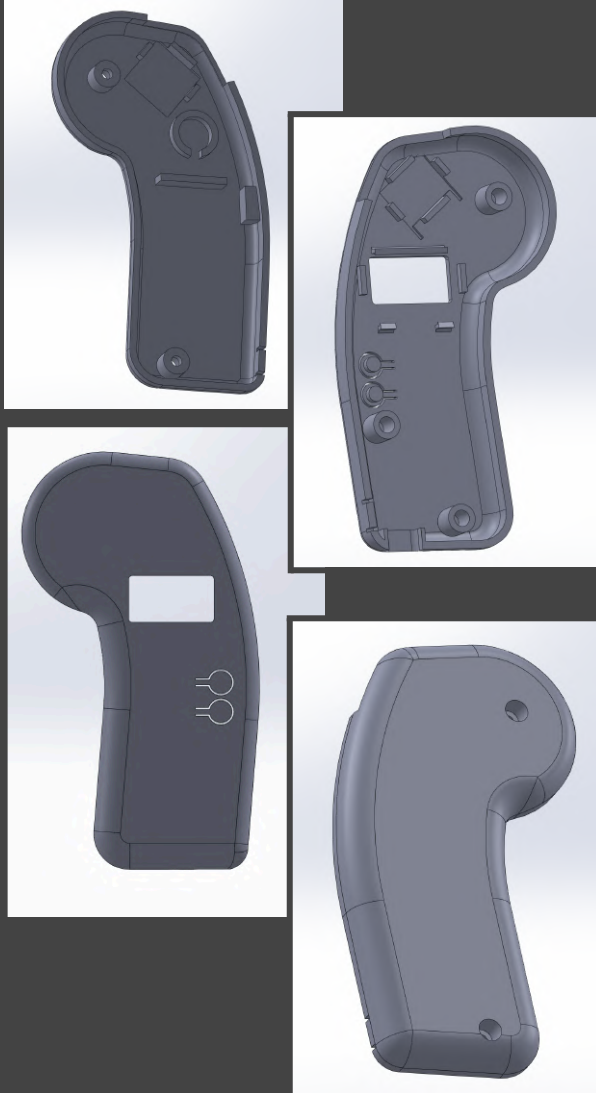
The total force was calculated using the following formulae:

- Final velocity = initial velocity + a * t
- 0 = 23.61 + a * 0.325
- Acceleration = -23.61 / 0.325
- Acceleration = -72.646 m/s²

- Total force acting on the body = 290 * (-72.646) N
- Total force acting on the body = -21,067 N
(negative Z direction)

22, 000 N was chosen to account for variations in mass or speed.

Olalekan Ashadele

osashade@uwaterloo.ca — (825) 454-9233

Electrium RC Case

SOLIDWORKS, Rapid Prototyping, PCB Packaging

As part of a cross-functional team, I designed an RC enclosure to support two different PCB layouts. The project emphasized adaptability and precision, requiring close coordination with both Hardware and Firmware teams. I applied Design for Manufacturing (DFM) principles throughout, optimizing the design for ease of assembly and production. Over the span of two weeks, I used rapid 3D printing to prototype and evaluate 8 design iterations, incorporating feedback at each stage.

Key features of the design included:

- Snap-fit clips for securing a compact LCD display, using manufacturer datasheets for accurate fit

- Threaded insert mounts for joining enclosure halves securely

- Internal recesses to house a 1-axis joystick, designed to interface with a ridged throttle wheel offering ~45° of rotation

By iterating quickly and adapting to changing specifications, I helped ensure the mechanical design integrated seamlessly with the electrical and firmware components. This project served as an excellent base for future projects involving several engineering disciplines.

Olalekan Ashadele

21120957

1B Electrical Engineering, Honours, Co-operative Program

This job is funded by the Government of Canada as advertised in the job posting. To be eligible you must be a Canadian citizen, permanent resident or a protected person defined by the Immigration and Refugee Protection Act. Do you meet this requirement?   Yes

Are you open to an 8 months co-op?   No