

# JIBRAIL BHAGWANDASS

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## SUMMARY

Mechanical Engineer (BASc, U of T – Mechatronics & Biology) with competition vehicle design, composite fabrication, structural FEA, and vibration/dynamics analysis experience. Delivered weight-optimized assemblies for a solar car competing across 3,000 km in Australia. Hands-on with CNC machining, composite layup, and additive manufacturing.

## TECHNICAL SKILLS

SOLIDWORKS | ANSYS FEA | CATIA | AutoCAD | MATLAB | Python | CNC Machining | Composite Layup (CFRP) | 3D Printing | GD&T | Vibration & Dynamics Analysis | PID Control | Bluebeam

## PROJECTS

### Structures & Fabrication – Blue-Sky Solar Racing

2022–2023

*University of Toronto Engineering Design Team*

- Designed, simulated, and manufactured structural components for a solar vehicle entered in the 2023 Bridgestone World Solar Challenge.
- Achieved ~15% weight reduction vs. prior generation through topology optimization and CFRP/aluminum honeycomb material selection.
- Performed static and dynamic FEA in ANSYS and SOLIDWORKS Simulation to validate stress, deflection, fatigue life, and vibration modes.
- Fabricated parts via composite hand layup and CNC-machined Foam; verified dimensional accuracy with GD&T inspection.
- Applied kinematics coursework to analyze suspension linkage geometry and load paths under cornering and braking scenarios.

### Electrical Team – Rovers for Space Exploration

2022–2024

*University of Toronto Engineering Design Team*

- Reduced electronics package volume ~20% to improve rover center-of-gravity placement; routed for EMI shielding and thermal management.

### Team Captain – FIRST Global Robotics Competition

2019

*Team Trinidad and Tobago | Dubai, UAE*

- Led 20+ members through full vehicle design-build-test in 6 weeks; PID-tuned drivetrain and impact-rated chassis earned the Safety Award.
- Placed 69th of 191 countries (top 36%), outperforming teams with significantly larger budgets through efficient design choices.

### Autonomous Maze-Solving Robot

2023

*University of Toronto*

- Engineered Arduino rover with ultrasonic/IR sensor fusion, PID differential steering, and 3D-printed rapid-prototyped chassis.

### Global Medic's Fire Skid – Mechanical Redesign

2023

*University of Toronto – Community Partner Project*

- Redesigned a portable fire-suppression system for pickup-truck mounting; ran ANSYS FEA to validate under dynamic off-road transport loads.

## EXPERIENCE

### HVAC Engineer

Sep 2023 – Sep 2024

*HTS Engineering Ltd | Toronto, ON*

- Engineered mechanical systems for \$20M+ projects (Scotiabank Arena, Trillium Hospital); performed thermal calculations and vibration-aware equipment mounting.
- Produced BIM models and construction drawings in AutoCAD/Bluebeam; coordinated with contractors to resolve design clashes pre-site.

### Biomedical Engineer

Aug 2025 – Nov 2025

*Eye See You Ophthalmic | Trinidad & Tobago*

- Diagnosed and repaired 15+ precision electromechanical instruments across 5+ hospitals with zero post-service callbacks.
- Troubleshoot electromechanical systems including motors, optical assemblies, and control boards under clinical time pressure.

## EDUCATION

### BASc, Mechanical Engineering | Minor: Robotics

2025

*University of Toronto – Specialization: Mechatronics & Biology | Certificate in Business*

*Key Courses: Finite Element Methods, Kinematics & Dynamics, Vibration Analysis, Mechatronics Systems Design, Machine Learning*

## CERTIFICATIONS

CSWA (Dassault Systèmes) | Google Project Management | Google Introduction to AI