

Fawaz Katranji

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Qualifications

- **Mechanical Design:** SOLIDWORKS, 3D printing, CNC machining, mechanical assembly, tolerance analysis, mechanism design, GD&T, FEA, DFM, DFA, test fixture design, rapid prototyping.
- **Engineering:** Circuit soldering, schematic reading, electrical lab tools, prototype validation, technical documentation, Python, MATLAB, C/C++, Git.

Education

University of Waterloo — Mechanical Engineering

Awards: *Sir Isaac Newton Physics Contest (2024): Ranked 66th in Canada, 109th worldwide* GPA: 3.3 / 4.0

Experience

Hardware Engineer — **NewGen Health** May 2026–Present

- Served as the **sole hardware engineer** responsible for developing the company's second-generation medical diagnostic prototype, collaborating directly with the founder throughout product development.
- Led the mechanical design of a **19-part** prototype assembly, developing the enclosure, internal architecture, sensor mounts, battery holder, and structural components through rapid CAD iteration.
- Advanced the product through two major prototype generations by prototyping, testing, and refining designs for improved functionality, manufacturability, and assembly.
- Manufactured and assembled multiple prototype iterations using advanced additive manufacturing techniques, soldering, and mechanical rework while validating waterproof sealing methods.
- Authored **10+** engineering documents covering testing procedures, assembly instructions, tolerance recommendations, engineering observations, and future design considerations.

Structures Member — **WAT Arrow** Mar 2026–Present

- Design structural aircraft components from concept to production-ready CAD using **SOLIDWORKS**, balancing weight, manufacturability, stiffness, and subsystem integration.
- Designed propulsion mounting systems, structural clamps, and landing gear assemblies for multiple aircraft prototypes while supporting iterative design improvements.
- Performed weight estimation and engineering trade-off analysis to reduce aircraft mass while maintaining structural performance.
- Collaborate within a **20+ member** multidisciplinary engineering team to integrate structural components with propulsion, avionics, and other aircraft subsystems.

Technical Team Member — **Waterloo Rocketry** Feb 2026–Present

- Designed a ground-based structural separation test chamber to safely evaluate staged airframe separation before flight testing.
- Engineered mechanical retention and release concepts while evaluating structural loading, tolerance stack-up, and subsystem integration.

Projects

Two-Stage 3D-Printed Planetary Gearbox Nov 2025–Jan 2026

- Designed a compact **two-stage 16:1 planetary gearbox** comprising **15+ custom components**, optimizing gear geometry, packaging, and torque transmission for additive manufacturing.
- Performed **stress analysis** to refine gear and carrier geometry, improving load distribution and reducing deformation under peak torque.
- Fabricated components through **iterative 3D printing** and validated performance through assembly testing, achieving **0.6° backlash**.

CNC Plotting Machine Jan 2024–Jun 2024

- Designed and assembled a complete **2-axis CNC plotting system**, integrating custom mechanical structures, motion electronics, and Arduino-based control into a fully functional electromechanical platform.

Robotic Arm Apr 2023–Jun 2023

- Designed and fabricated a **4-DOF robotic manipulator**, optimizing link geometry and joint placement to maximize reachable workspace while maintaining structural rigidity.