

KAI GOODALL

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SKILLS

Design & Simulation: Fusion360, SolidWorks, AutoCAD, ANSYS (FEA/CFD), MATLAB, Python

Manufacturing: CNC & Manual Machining (Mill/Lathe), Welding (MIG/TIG), Additive Manufacturing (FDM/SLM/WAAM)

Electronics & Controls: Soldering, Embedded Systems (ESP32), C++, Git, Command Line

TECHNICAL EXPERIENCE

Waterloo Rocketry | *Propulsion Subsystem Member*

Waterloo, Canada

Propulsion Subsystem Member

Sep 2024 – Present

- **Critical Manufacturing:** Owned the end-to-end fabrication of the injector bulkhead for Liquid Static Fire 4; utilized manual lathe, mill, and rotary table to deliver a mission-critical component that successfully withstood peak loads of 17,000N (1,750kg), resolving a failure point from the previous test cycle.
- **Propulsion Test Engineering (Primary Operator):** Served as ‘Primary’ for a 9kN liquid rocket engine static fire; managed 650 psi propellant feed systems and safety-critical valve sequences, enabling a successful 10-second full-duration burn.
- **Material Science & Design Validation:** Directed material research for a 2-year development project of a regeneratively cooled combustion chamber; identified and sourced C18150 (CuCrZr) and C12200 alloys to provide high-temperature material properties required to validate structural FEA and CFD simulations.
- **Brazing R&D:** Worked alongside Propulsion Lead to develop joining methods for coaxial shear injectors; performed furnace-braze cycles of 316L/304L stainless steel faceplates to hypodermic needles using silver and brass fillers, followed by destructive assessment of bond integrity.

ODF/ Merge | *Technical Program Lead, Merge Grant*

San Francisco, USA (Remote)

Merge is a microgrant program for young builders working on technically ambitious high impact projects

Apr 2024 – Present

- **Technical Due Diligence:** Served as the sole technical evaluator for 2,000+ grant applications, performing rapid feasibility audits on high-impact projects; distributed \$35,000+ to 44 technical initiatives, resulting in \$6,000,000+ in follow-on funding for grantees.
- **Systems Architecture & Automation:** Engineered an end-to-end operational workflow in Airtable to manage a 40x increase in monthly application volume (14 to 600+); automated financial review, progress logging, and multi-stage communication pipelines, reducing per-application processing time by 20x.

Solideon | *Additive Manufacturing Engineering Summer Intern*

San Francisco, USA

Solideon is a startup building the world's first autonomous deployable additive manufacturing systems

Jun 2024 – Sep 2024

- **Precision Robotic Calibration:** Designed and fabricated a 6-axis calibration system for robotic WAAM heads, including a rigid aluminum extrusion stand, CNC-machined faceplate, and 3D-printed tapered probe, enabling a transition to autonomous, sub-millimeter laser gate verification, and achieving a 10x increase in system precision.
- **Rapid Prototyping & DFM Support:** Served as the primary technical resource for all internal FDM additive manufacturing, providing Design for Manufacturing (DFM) expertise; designed and printed 30+ functional components in Fusion360, including PCB enclosures and test-head replicas, ensuring zero bottlenecks in the hardware integration pipeline.
- **Manufacturing Preparation & Fixturing:** Prepared 8' x 4' x 4" thick aluminum customer part for production by engineering high-stability work-holding; precision-drilled 33 1.5" diameter bores to secure the assembly to the welding table. Mitigated high-heat thermal loads during active WAAM cycles, successfully preventing warping and ensuring a successful print to design tolerances.

Telesat | *IV&V Systems Engineering Intern*

Ottawa, Canada

Telesat is the 4th largest fixed satellite service provider in the world, operating over 20 GEO satellites

Jul 2023 – Dec 2023

- **Fleet-Scale Network Emulation:** Conducted network performance testing for a 198-satellite LEO constellation using CLI-based in-house emulation tools; validated routing protocols and latency requirements across global ground stations and orbital nodes.
- **Requirements & Lifecycle Management:** Managed and synchronized comprehensive engineering timelines for 300+ engineering staff in Jira; integrated project tracking with Jama to ensure end-to-end traceability between internal design specs and external mission requirements.

EDUCATION

University of Waterloo

Waterloo, Canada

Bachelor of Applied Science (BASc), Mechanical Engineering, Co-op

Expected Graduation: Apr 2030

Awards / Scholarships: President's Scholarship (\$2,000; 95%+ admission average), Dean's List: Winter 2025

ACTIVITIES & INTERESTS

- **Speaker/Panelist:** World Summit AI Montreal, C2 MTL, Collision Conference Toronto
- **Interests:** Whitewater Sports (Kayaking, Canoeing, & Rafting) | Previous Lead Whitewater Kayaking Instructor (2022-2024) | Extreme Downhill Skiing | Music (Saxophone, flute, & piano) | Film Photography