

Curriculum Vitae/Resume - Koda Mitsuhashi - MSE in Mechanical Engineering

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EDUCATION

University of Michigan, Ann Arbor, MI

GPA: 3.81 / 4.00

Bachelor of Science in Engineering in Mechanical Engineering

December 2026

Relevant Coursework: Manufacturing Processes, Fluid Mechanics, Dynamics & Vibrations, Heat Transfer, Dynamic Control Systems, Mechanical Behavior of Materials, Thermodynamics, Solid Mechanics

WORK EXPERIENCE

University of Michigan, Naval Architecture & Marine Engineering Department

Ann Arbor, MI

Research Assistant, Zuo Lab

May 2026 - Present

- Designed and prototyped a bench-scale inerter-spring-damper load absorber for mooring snap-load mitigation in wave energy converters, realizing mechanical inertance via a flywheel and variable damping via a resistively shunted generator, integrated into a working proof of concept.
- Developed an Arduino-controlled regenerative DC-DC boost converter with feedforward/integral control firmware emulating a 12–130 Ω commandable load; validated closed-loop damping tracking and reduced peak load response versus an undamped baseline.

University of Michigan, Mechanical Engineering Department

Ann Arbor, MI

Research Lead, Cooper Lab

January 2025 - May 2025

- Led a three-person research team under graduate mentor to develop alternative end-of-life pathways in 3D printing applications for post-consumer plastics.
- Applied ASTM D638 and D256 standards to evaluate mechanical properties of recycled tPLA/PLA; printed/tested 40+ specimens; demonstrated 56% energy-use reduction with minimal structural degradation
- Co-authored paper accepted to ASME IDETC 2025.

Research Assistant, Park Lab

September 2023 - August 2024

- Researched photosensitive self-actuating reversible nanostructures with graphene–PDMS–aluminum trilayers on glass substrates; designed and tested six pattern variations to study effects of blade curvature and neck width on actuation magnitude and reversibility;
- Fabricated 100+ samples achieving 70% actuation strain and 10x higher reversibility than industry norm.

PROJECT EXPERIENCE

Michigan Aeronautical Science Association (MASA)

Ann Arbor, MI

LOx Fill Valve Lead

April 2025 - December 2025

- Oversaw redesign and structural validation of LOx fill valve and quick-disconnect assembly using Siemens NX and Ansys for engine coldflow testing and integration into the main rocket.
- Conducted Hertzian contact stress analyses to select appropriate seat material and optimize valve sealing performance under 850 MAWP conditions; validated design through successful hydrostatic testing and cryoflow rated up to 1,250 psi.
- Created drawings and tolerance stacks for 8 custom components; authored SOP and P&ID for valve separation testing.

Propulsion Subteam Member

January 2025 - December 2025

- Calculated CdA across engine flow path to design a custom orifice replicating 450 psi chamber pressure drop for a LN2/water coldflow; analyzed PT data in Synnax, achieving 11% deviation from target dP, confirming successful coldflow.

SKILLS

CATIA V5, SOLIDWORKS, Onshape, Siemens NX, Fusion 360, Ansys, ADAMS, MATLAB, C++, 3D Printing, Machine Shop, GD&T, Excel