

# Katana Rain Finlason

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## Education

### MASSACHUSETTS INSTITUTE OF TECHNOLOGY (M.I.T.)

M.S. & B.S. in Mechanical Engineering. GPA: 4.9/5.0

Concentration in Product Development and Machine Design with a minor in Energy Studies

#### Relevant coursework:

Mechanics and Materials	Design and Manufacturing	Energy in Global Development
Numerical Computation	Thermal-Fluids Engineering	Advanced Measurement and Instrumentation
Dynamics and Control	Product Engineering	Elements of Mechanical Design
Structural Materials	Compliant Mechanisms	

## Skills

<ul style="list-style-type: none"><li>CAD &amp; CAM Software (SolidWorks &amp; Fusion 360)</li><li>Product Design &amp; Design for Manufacturing</li><li>Rapid Prototyping (FDM/SLA 3D Printing)</li><li>MATLAB &amp; C++</li><li>Mechanical Analysis &amp; Testing</li></ul>	<ul style="list-style-type: none"><li>CNC &amp; Manual Machining</li><li>Plastic Injection Molding &amp; Thermoforming</li><li>Microsoft Office &amp; Adobe Suite</li><li>Technical Documentation</li><li>Presenting &amp; Public Speaking</li></ul>
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## Job Experience

### Graduate Researcher [Sep 2023 - June 2025]

MIT Mechanical Engineering Department (CADLAB)

- Conceptualized and designed incubators for species which exhibit temperature-dependent sex determination
- Ran thermal simulations to evaluate transient heat transfer when deployed infield
- Consulted with conservationist community partners in Jamaica to implement incubators for Hawksbill Sea Turtle eggs

### Instructor [Jan 2023 - June 2024]

MIT

- Coached students in three of the most well-known mechanical engineering classes at MIT (2.009 ‘Product Engineering Process’, 2.00B ‘Toy Product Design’, and 2.00 ‘Introduction to Design’)
- Compiled lecture and lab materials while simultaneously coordinating large scale events that catered to thousands of viewers

### Apprentice & TA [Feb 2022 - June 2023] & [Feb 2025 - June 2025]

MIT Pappalardo Lab

- Worked as a machine shop apprentice and held weekly office hours to cover technical engineering content
- Assisted with robot construction in the class ‘Design and Manufacturing I’
- Machined my own fully-functioning stirling engine, camelback straightedge, and anchor windlass wildcat

### Lab Assistant & TA [Sep 2022 - June 2023] & [Sep 2024 - Dec 2024]

MIT Laboratory for Manufacturing and Productivity

- Taught the art and science of large scale manufacturing operations in lecture/lab for the class ‘Design and Manufacturing II’
- Created documentation to help students gain a fundamental understanding of machine tools and injection molding

### Intern [June 2022 - Sep 2022]

UROP

- Built the housing and optical fluidics system for a digital holographic microscope using 3D printing & laser cutting
- Worked on a similar technology for an underwater ocean lander that was deployed during the 2024 MIT Marine Robotics Program on Faial Island in the Azores

## Projects

**Desktop Lathe:** A portable lathe with a cutting repeatability specification within 100 microns

- Modeled the system using core engineering principles to determine if the system’s functional requirements were met
- Analyzed the compliant mechanisms with FEA software before machining the high precision metal parts

**Off-grid Chick Brooder:** An incubator that uses thermal batteries instead of electricity to warm chicks without supervision

- Conducted temperature regulation experiments to assess thermal battery performance
- Expanded the project by travelling to Cameroon to rebuild the brooder in collaboration with local African farmers

**Injection Molded Yo-yo:** A plastic yo-yo toy made entirely from scratch

- Designed the toy model and aluminum molds using CAD and CAM software before fabrication
- Refined the injection molding parameters to establish the optimal metrics for avoiding defects

Detailed project portfolio: <https://katanarain.github.io/portfolio/portfolio.html>