

Junior Mechanical Design Engineer, Thermal Systems

📍 Madison, WI 53703

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MY CAREER



- Graduate Thermal Systems Research Assistant, Thermal Fluid Research at University Research Lab (2 Years)
- Mechanical Engineering Thermal Design Lead, Rack Cooling Prototype at Capstone Project (4 Months)
- Thermal Fluid Research Assistant, Experimental Analysis at Academic Research (3 Months)

- Evaluated heat pipes, **vapor chambers**, cold plates, and **heat exchangers** for electronics cooling tradeoffs.

Mechanical Engineering Thermal Design Lead, Rack Cooling Prototype

Capstone Project 📅 January 2024 - May 2024 📍 Madison, WI

Directed thermal design for a rack scale electronics cooling prototype, coordinating component modeling, mechanical design, instrumentation, validation planning, and technical review. Translated system requirements into practical hardware decisions for a laboratory **data center** representation.

- Led rack scale cooling design covering component heat loads, coolant routing, and heat rejection.
- Developed **MATLAB** framework estimating component temperatures, coolant rise, pressure losses, and flow allocation.
- Designed cold plate interfaces and mechanical components in **SolidWorks** for prototype fabrication and integration.
- Planned temperature, pressure, and flow **instrumentation** around defined **model validation** objectives in test plans.
- Compared **liquid cooling**, heat pipe, and vapor chamber concepts through documented design tradeoffs.
- Presented model comparisons, limitations, and recommended experiments during faculty design review.

Thermal Fluid Research Assistant, Experimental Analysis

Academic Research 📅 September 2023 - December 2023 📍 Madison, WI

Supported supervised thermal fluid research on compact **heat exchangers** through laboratory preparation, instrumentation calibration, analytical modeling, data processing, and technical reporting. Produced repeatable analysis that connected measured operating conditions with thermal performance and model limitations.

- Investigated compact heat exchanger behavior across flow conditions, **pressure drop**, and heat transfer performance.
- Implemented **Python** scripts cleaning **data acquisition** files, calculating thermal quantities, and visualizing experimental behavior.
- Constructed **steady state models** using **heat transfer** and fluid dynamics principles for measured test conditions.
- Calibrated thermocouples, differential pressure sensors, and flow instrumentation before structured laboratory testing.
- Explored data driven thermal response prediction and compared limits against physics based analytical methods.
- Produced technical documentation describing methods, assumptions, results, uncertainty, and follow up experiments.

PROJECTS

Rack Scale Electronics Cooling Study 📅 2024

Connected thermal architecture decisions with practical engineering purpose by modeling component loads, coolant routing, heat rejection, and validation methods for a laboratory scale data center cooling concept.

Compact Heat Exchanger Validation Study 📅 2023

Explored how careful measurement can improve engineering judgment through Python analysis, calibrated instrumentation, pressure drop modeling, heat transfer evaluation, and uncertainty aware comparison.

LEADERSHIP & AWARDS

- Graduate Research Poster Recognition, 2026, awarded for clear thermal systems research communication.
- Dean's List, 2023 and 2024, recognized sustained academic performance in mechanical engineering.
- Mechanical Engineering Capstone Design Team Lead, coordinated thermal design decisions and final technical review.

CERTIFICATIONS

- MATLAB Onramp, MathWorks 📅 2024
- Machine Learning with Python, Coursera 📅 2025

PROFESSIONAL AFFILIATIONS

- Graduate Research Peer Mentor, University Research Lab, supported colleagues with thermal testing and analysis.
- Mechanical Engineering Capstone Design Team Lead, coordinated prototype design reviews and technical documentation.

ADDITIONAL INFORMATION

Work Status : Authorized to work in United States. No sponsorship required.

REFERENCES

AVAILABLE ON REQUEST