Ryan Malone

Mechanical Engineering | Thermal Systems | CFD | Liquid Cooling

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EDUCATION

Case Western Reserve University

B.S.E. in Mechanical Engineering

First-year undergraduate | Fall 2026 - Present | Expected May 2030

RESEARCH EXPERIENCE

Undergraduate Researcher | Kharangate Thermal-Fluid Laboratory

Case Western Reserve University | August 2026 - Present

- Prepared geometry and inflation-layer meshes for two-phase CFD studies in ANSYS Fluent under Huigang Wang's guidance.
- Directed Codex-assisted SolidWorks candidate development for a condensation test section intended to improve optical access for future PIV; design review remains in progress.
- Participated in supervised refrigerant-loop tests and reviewed recorded pressure and temperature channels while investigating low-flow measurement limits.
- Communicated with Emerson technical support about low-flow meter readings and replacement options.
- Conducted supervised flow-boiling work with PhD researcher Huigang Wang to observe bubble formation and motion.
- Assembled an adjustable camera fixture, cutting aluminum rods and aligning sliding mounts.

ENGINEERING PROJECTS

Single-Phase Thermal-Hydraulic Cooling Test Bench

August 2026 - Present | Design and experimental planning

- Developed a cold-plate bench design linking energy-balance and thermal-resistance calculations to source/coolant temperature sensing, heater-terminal power measurement and gravimetric flow measurement.
- Defined proposed calibration, uncertainty and repeat/remount procedures; planned pressure-drop characterization and future reference-test and air-cooled heat-sink studies.

Rocket Nose Cone Design and Assembly

January - May 2025

- Modeled a rocket nose cone in SolidWorks, built the part and adjusted its fit during assembly; the team placed third among 15 two-person teams.

Autonomous Robot

January - May 2025

- Programmed and tested an autonomous robot with a team to retrieve blocks of various sizes and place them at designated destinations; the team was one of four out of 15 teams to complete the task without errors.

TOOLS AND METHODS

Thermal and CFD: ANSYS DesignModeler and Meshing, ANSYS Fluent, Heat transfer, energy balance and pressure-flow fundamentals

Design and prototyping: SolidWorks, 3D printing and assembly, Arduino

Programming and data: MATLAB, Python, Excel, Git / GitHub