

Yousef Saleh

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Mechanical Engineer | Research and Development Test & Validation | Thermal/Fluid Systems | Instrumentation & Automation

Professional Profile

Mechanical engineer with an earned doctorate in Mechanical Engineering from Florida State University and experience spanning research and development test systems, compressor/chiller validation, thermal-fluid analysis, instrumentation, calibration/metrology, automation, experimental aeroacoustics, and controlled technical documentation. Current work focuses on making complex lab systems more reliable and repeatable through calibration planning, measurement systems analysis, test-rig troubleshooting, Python-based analysis, instrument connectivity, automation tooling, vendor coordination, training, and document control. Research background includes high-pressure/high-temperature supersonic aeroacoustic experiments, custom test hardware, high-fidelity acoustic measurements, data acquisition automation, and peer-reviewed publications.

Education

Doctor of Philosophy, Mechanical Engineering | Florida State University | May 2026

Dissertation: *Aeroacoustics of non-axisymmetric supersonic jets*

Master of Science, Mechanical Engineering | Florida State University | Fall 2023

Bachelor of Science, Aerospace Engineering | The University of Texas at Austin | December 2018

Technical Capabilities

Thermal and fluid systems: heat transfer, thermodynamics, refrigeration fundamentals, compressor performance, pressure-ratio behavior, corrected mass-flow analysis, high-pressure and high-temperature systems, supersonic flow

Test and validation: hardware validation, rig readiness, calibration planning, measurement systems analysis, measurement traceability, instrumentation, data acquisition, root-cause analysis, controlled documentation, audit support, restoration of testing capability coordination

Automation and analysis: Python, MATLAB, LabVIEW, compressor maps, compressor performance curves, efficiency contours, digital signal processing, image-based automation prototypes, executable packaging, tools for technicians and engineers

Hardware and controls: industrial controllers, compact real-time controllers, protocol gateways, networked communications hardware, electrical standards, pressure standards, temperature references, power meters, flow meters

Quality and process: root-cause analysis, failure-mode analysis support, controlled procedures, calibration standards, training records, document control, measurement traceability workflows, vendor coordination

Design and experimental methods: SOLIDWORKS and computer-aided design, nozzle design, custom mechanisms, fixture concepts, schlieren, shadowgraph, particle image velocimetry, acoustic measurement, experimental facility operation

Professional Experience

Danfoss Turbocor Compressors Inc. — Senior Lab Engineer

Jan 2025 - Present

- Lead validation readiness across compressor and chiller research and development test platforms, coordinating calibration planning, troubleshooting, measurement systems analysis, controlled documentation, and lab support.
- Support calibration and measurement systems analysis activities across multiple test platforms, including pressure, temperature, electrical, flow, and torque instrumentation.
- Troubleshoot instrumentation and hardware issues involving thermocouple configuration, pressure signals, power meters, data acquisition behavior, serial and network communications, and measurement traceability.
- Build software-based calibration and analysis tools for instrument connectivity, compressor data review, and semi-automated electrical and temperature calibration.
- Advance pressure and temperature calibration automation from prototype scripts toward tools for technicians and engineers, including executable packaging, training handoff, and use by other team members.
- Develop tools for technicians and engineers and harden automated applications with clearer error reporting, channel checks, and improved user-input handling.
- Advance direct measurement retrieval and networked communications to reduce manual steps in temperature and pressure automation.

- Build and verify a duplicate portable hardware test platform integrating an industrial controller, compact real-time controller, data acquisition, protocol gateway, power distribution, and network hardware.
- Complete electrical calibration training and apply it to internal electrical calibration procedures, handheld gage troubleshooting, and lab environmental awareness.
- Establish and expand internal torque-wrench calibration capability through documentation, training, standard setup review, measurement decision limits discussion, and spare procurement coordination.
- Coordinate external vendors and internal stakeholders for pressure standards, power-meter calibration, water-flow-meter selection, chamber service, lab build-out, and lab readiness.

The University of Texas at Austin — Research Assistant

Dec 2016 - Dec 2018

- Improved data reliability in a Mach 1.8 wind-tunnel environment by reconfiguring acquisition workflows and preventing data loss during testing.
- Installed hardware and developed a feedback control solution to regulate shock location in a scramjet isolator under incoming perturbations.
- Built hardware and software applications to interpret flow properties and analyze physical behavior in high-speed test environments.

Graduate Research Experience

Florida State University — Graduate Research Engineer

Aug 2019 - Jan 2025

- Designed and executed high-pressure, high-temperature aeroacoustic experiments, operating supersonic facilities up to 1500 K stagnation temperature and Mach 2.5 fully expanded jet conditions.
- Operated a high-pressure anechoic facility and supported experiments involving supersonic jets, non-axisymmetric nozzle geometries, acoustics, flow visualization, and thermal-fluid behavior.
- Designed custom nozzles, precision mechanisms, and experimental hardware for controlled supersonic testing and large-scale data collection.
- Designed an in-situ rotating nozzle mechanism and automated Method of Characteristics workflows for supersonic nozzle development and acoustic mapping.
- Automated acquisition and processing workflows for large experimental datasets, including acoustic reconstruction, instrumentation synchronization, and data reduction.
- Calibrated and synchronized precision microphones and data systems to improve repeatability and data reliability.
- Built and used flow-visualization methods including shadowgraph, schlieren, particle image velocimetry, and a Z-type schlieren system.
- Defined fuel-system and thermal-system components for a hot-jet retrofit and mentored students through setup, testing, analysis, and technical communication.

Selected Technical Projects

- **Compressor Performance Analysis:** Developed Python-based compressor performance workflows for compressor performance curves, efficiency contours, pressure-ratio behavior, corrected mass-flow analysis, and review of anomalous compressor datasets.
- **Calibration Automation:** Built pressure, temperature, and electrical calibration automation workflows using electrical standards, power meters, image-based automation prototypes, networked communications, and deployment considerations for tools used by technicians and engineers.
- **Portable Test Platform Communications and Data Cluster:** Built a duplicate hardware platform integrating an industrial controller, compact real-time controller, data acquisition, a protocol gateway, power distribution, and networking hardware for prototype bring-up and system replication.
- **Water Flow Meter Replacement:** Derived requirements, coordinated vendor discussions, and supported fit checks, calibration support sessions, hardware inspection, and troubleshooting for new flow meters.
- **Heated Jet Thermal Retrofit:** Defined fuel and thermal system components in piping and instrumentation format, including heating and cooling requirements for a heated supersonic jet system.
- **Shock-Location Control Study:** Supported closed-loop control research by installing hardware and developing feedback-control logic to regulate shock-train location under perturbations.

Publications

- Saleh, Y. (May 2026). *Aeroacoustics of non-axisymmetric supersonic jets* [Doctoral dissertation, Florida State University]. <https://doi.org/10.17605/OSF.IO/X5CE6>

- Saleh, Y., Sellappan, P., & Alvi, F. S. (2023). "Experimental Characterization of the Acoustics of a Supersonic Diamond Jet." *AIAA Journal (American Institute of Aeronautics and Astronautics)*.
- Saleh, Y., Seckin, S., Song, M., & Alvi, F. S. (2023). "Mapping 3D Acoustics of a Supersonic Diamond Jet: An Odyssey in the Golden Age of Aeroacoustics." *American Institute of Aeronautics and Astronautics Aviation Forum*.
- Reyes, A. N., Saleh, Y., Gustavsson, J., Jolowsky, C. N., Kumar, R., Treadwell, L. J., & Sweat, R. D. (2024). "Supersonic hot jet ablative testing and analysis of boron nitride nanotube hybrid composites." *Composites Part B: Engineering*.
- Reyes, A., Treadwell, L., Saleh, Y., Gustafson, J., Kumar, R., & Sweat, R. (2023). "Supersonic Hot Jet Analysis of Boron Nitride Nanotube Hybrid Composites Under Extreme Heat and Pressure Conditions." *Composites and Advanced Materials Expo*.
- Vanstone, L., Bosco, A., Saleh, Y., Akella, M., Clemens, N. T., & Gogineni, S. (2020). "Closed-loop control of unstart in a Mach 1.8 isolator." *Journal of Propulsion and Power*.
- Prasad, A., Saleh, Y., et al. (2022). "Near-field and far-field effects of heating in an over-expanded Mach 2 diamond jet." *American Institute of Aeronautics and Astronautics Science and Technology Forum 2022*.

Teaching, Training, and Mentorship

- Developed and delivered internal instruction on refrigeration and thermodynamics fundamentals for engineers and test operators.
- Created custom slide decks, examples, quizzes, and assessment materials tied to compressor and chiller testing.
- Mentored interns, technicians, junior engineers, and students in calibration execution, experimental setup, data processing, documentation, and troubleshooting.
- Supported a Florida A&M University–Florida State University capstone collaboration through project proposal, kickoff, lab tours, scheduling, simplified piping and instrumentation work, and scope development.

Leadership and Service

The University of Texas at Austin — Chief Engineer, Aircraft Design

Jan 2018 - May 2018

- Managed a team of 8 engineers through aircraft design requirements, risk assessment, sizing, payload, power, and control decisions.
- Evaluated control surfaces, electrical connections, wiring, sensors, and autopilot systems.
- Performed risk assessment and generated mitigation protocols for an unmanned air system concept.
- Developed an emergency-response concept for surveillance and payload drops.

The University of Texas at Austin — President, Water Ski Team

Nov 2016 - Nov 2017

- Coordinated 60 members and a 10-person officer board.
- Oversaw a \$55,000 operating budget covering competition lake lease, equipment, boat maintenance, travel, lodging, and merchandise.
- Established a modern website, updated team branding, and developed long-term growth and talent-development plans.
- Recruited coaching support and refocused team operations toward competitiveness and member development.

Certifications and Training

Section 608 refrigerant-handling certification; electrical calibration training; arc flash training; lockout/tagout refresher training; compressor training modules and in-person training; measurement systems analysis self-assessment; export control and internal compliance training.