Yousef Saleh

(512) 815-4237 | ysaleh@fsu.edu
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Open to relocation

EDUCATION

Doctor of Philosophy, Mechanical Engineering, Summer 2024 — **Tallahassee, FL**
Florida State University

Master of Science, Mechanical Engineering, Fall 2023 — **Tallahassee, FL**
Florida State University

Bachelor of Science, Aerospace Engineering, December 2018 — **Austin, TX**
The University of Texas at Austin

PROJECTS

Project S
- Record quantitative information of supersonic flow generated by non-axisymmetric supersonic jets
- Integrate novel technique to reconstruct three-dimensional flow-fields to accompany acoustic surfaces
- Derive connections between flowfield and concurrent acoustics

Project Y
- Reconstructed three-dimensional surface to map acoustics radiated by a supersonic jet
- Designed system capable outputting 1,000 Nm of torque to spin a supersonic nozzle under load
- Automated testing process to collect > 300 million points necessary for acoustic reconstruction

Hot Jet Thermal Retrofit
- Defined fuel and thermal system components into standardized P&ID diagram
- Established heating requirements to maintain gaseous flow of fuel into overall system
- Derived heat output requirements of burner system to generate aerospace-grade heated supersonic jets
- Developed cooling requirements to prevent system deterioration due to significant thermal gradients
- Proposed alternative fueling subsystem to transition from difficult-to-acquire Ethylene to county-provided natural gas

Supersonic nozzle design
- Innovate Method of Characteristics(MOC) method to design supersonic nozzle
- Design two-piece supersonic rectangular nozzle
- Automate MoC algorithm to invent geometry for novel elliptic nozzle

Supersonic flow visualization
- Constructed Z-type schlieren system to visualize flows with strong gradients
- Synchronized acquisition cameras, LEDs, and facility equipment to capture footage with <10 μs exposure time
- Employed modal decomposition techniques to understand the strongest features of the flow

Acoustic measurements in an Anechoic chamber
- Calibrated and synchronized 8 B&K Type 4954B microphones
- Measured far-field noise generated by a supersonic diamond jet at various configurations
- Published findings in peer-reviewed journal articles and presented results at scientific conferences

Data acquisition improvements
- Reconfigured complex, existing LabView software
- Introduced new mechanisms to prevent loss of data during tests
- Performed rigorous calibrations to ensure reliability of test data

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Unstart control
- Installed new hardware coupled with a custom PID controller to control the location of shocks in a scramjet engine isolator
- Maintained location of shocks within an engine isolator regardless of incoming perturbations
- Designed system capable outputting 1,000 Nm of torque to spin a supersonic nozzle under load
- Published results in peer-reviewed journal articles

Aircraft design
- Developed wing-loading simulation test to test theoretical and real limits of wing load
- Designed and built payload dropping mechanism
- Defended, discussed, and negotiated aircraft design decisions with consumers

Budget defense
- Coordinated between executive team members to evaluate organizational costs & resources
- Created succinct presentation to present results
- Defended resource spending to regulatory authority and requested additional funding for growth

EXPERIENCE

Graduate Research Engineer, Florida State University 08/2019 – present
- Operated a high-pressure anechoic facility with stagnation temperatures up to 1500 K, generating supersonic jets up to a fully expanded Mach number of 2.5.
- Analytically design supersonic nozzles of various geometries through innovation of established techniques for new purposes to create Mach 2 Rectangular and Elliptic nozzles
- Produced flow visualizations through recognized techniques such as Shadowgraph, Schlieren, and Particle Image Velocimetry (PIV)
- Recorded and Analyzed data obtained using a variety of transducers to obtain spectral characteristics and recognize the acoustic capabilities of various types of nozzles and forms of active & passive flow control
- Exposure to high Overall Sound Pressure Level (OASPL) sounds and experience on how to mitigate and control
- Analyzed continuous time signals and perform digital signal processing on discrete time signals
- Authored multiple conference and peer-reviewed journal papers and technical instructions/documentation
- Automated experimental processes to rapidly collect and process billions of data points to develop better understandings of the problems investigated
- Designed and developed a mechanism to rotate a supersonic nozzle in-situ, in increments of 0.25°, in order to map the acoustics generated by the jet

Research Assistant, The University of Texas at Austin 12/2016 – 12/2018
- Initiated new process of data collection which increased efficiency from 92% to 100% through innovation of the LabVIEW software that controls the mechanical devices, instruments, and transducers, data collection units, and tanks that govern the Mach 1.8 wind tunnel
- Integrated a system of high-pressure jet streams, in conjunction with a ramp contained within the wind tunnel to introduce pressure perturbations into the flow
- Constructed a PID controller to maintain the location of the shock train in the face of pressure disturbances regardless of frequency or magnitude
- Built hardware and software applications to further understand flow properties and analyze physical behaviors

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ACADEMIC & LEADERSHIP EXPERIENCES

Chief Engineer, Aircraft Design, The University of Texas at Austin 01/2018 – 05/2018

- Managed a team of 8 engineers to meet requirements, such as wing loading, payload, mass, speed, duration, risk assessment, sizing, and power, as requested by the customer in the RFI
- Evaluated control surfaces, electrical connections & wires, sensors, and autopilot systems
- Performed risk assessment and generated risk mitigation protocols
- Developed an Unmanned Air System (UAS) capable of following a flight path for assistance with fire & rescue emergency services via surveillance and payload drops

President, The University of Texas Water Ski Team 11/2016 – 11/2017

- Coordinated 60 members with a 10-person executive officer board to produce new forms of revenue, established a modern website, designed advertisements to accentuate the team brand across the nation
- Oversaw use of $55,000 to lease a competition ski lake, procure new equipment, uphold and maintain a boat, cover traveling & accommodation costs, and restructured merchandise acquisition and distribution
- Refocused the team towards competitiveness and recruited a coach to accelerate individual growth
- Developed a long-term plan for the growth of the team and talent development

SKILLS

- Expert in Acoustics, Fluid Mechanics, Heat transfer, Test design, and system evaluation and automation
- Experienced with MATLAB, Python, C, SOLIDWORKS, LabVIEW, Office, HTML, CSS, JavaScript, oscilloscopes, multimeters, power supplies, lab equipment, active noise control, signal generators, anechoic chambers and their specifications
- Adept with high pressure systems, data acquisition, microphones, discrete and continuous time signal processes, labs, audio analysis, acoustic measurements using tools like B&K microphones, and digital signal processing
- Strong oral & written communication, self-motivated, team leadership, time management, test automation, attention to detail, managing large sets of data, and problem solving
- Work independently or in teams and adapt communication methods
- Proficient with engineering management, scheduling, technical discussion, room acoustics, passive noise control, and explanation of complex concepts
- Fluent in Arabic and English

PUBLICATIONS

- **Saleh, Y.**, Seckin, S., Song, M. and Alvi, F.S., 2024. "Mapping 3D Acoustics of a Supersonic Diamond Jet". Experiments in Fluids. *in progress.*
- Reyes, A., **Saleh, Y.**, Gustavsson, J., Jolowsky, C., Kumar, R., Treadwell, L., & Sweat, R. (submitted). Supersonic Hot Jet Ablative Testing and Analysis of Boron Nitride Nanotube Hybrid Composites. *Composites Part B: Engineering*. Manuscript submitted for publication.

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- 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. In *CAMX*. Atlanta, GA.
- **Saleh, Y.**, Seckin, S., Song, M. and Alvi, F.S., 2023. Mapping 3D Acoustics of a Supersonic Diamond Jet: An Odyssey in the Golden Age of Aeroacoustics. In *AIAA AVIATION 2023 Forum* (p. 3214).
- **Saleh, Yousef**, Sellappan, P., Alvi, F.S., "Experimental Characterization of the Acoustics of a Supersonic Diamond Jet**",** *AIAA Journal* 61.10 (2023) pp: 4546-4555.
- **Saleh, Y.**, Seckin, S., Song, M. and Alvi, F.S., 2023. Mapping 3D Acoustics of a Supersonic Diamond Jet: An Odyssey in the Golden Age of Aeroacoustics. In *AIAA AVIATION 2023 Forum* (p. 3214).
- Prasad, A., **Saleh, Y.**, Sellappan, P., Unnikrishnan, S. and Alvi, F.S., 2022. Effects of Expansion Ratio and Nozzle Asymmetry on Flowfield of Diamond Jets. *AIAA Journal*, *60*(9), pp.5215-5231.
- Prasad A., **Saleh, Yousef**, et al. "Near-field and far-field effects of heating in an over-expanded Mach 2 diamond jet." In *AIAA SCITECH 2022 Forum*. 2022.
- **Saleh, Yousef**, et al. "Experimental and Computational Study of a Mach 2 Diamond Jet." In *AIAA Scitech 2021 Forum*. 2021.
- Vanstone, L., Bosco, A., **Saleh, Y.,** Akella, M., Clemens, N.T. and Gogineni, S., 2020. Closed-loop control of unstart in a Mach 1.8 isolator. *Journal of Propulsion and Power*, *36*(1), pp.153-157.