Jackson Asiatico

Daytona Beach, FL 32828
+1 (270) 401-6125 | jackson.asiatico@gmail.com

EDUCATION

Embry-Riddle Aeronautical University	Ph.D. Aerospace Engineering	***Expected Graduation: Dec 2026***
University of Central Florida	M.S. Aerospace Engineering	***Graduated: Aug 2023***
Georgia Southern University	B.S. Mechanical Engineering	***Graduated: May 2021***

EXPERIENCE

Graduate Research Assistant – NASA's Dragonfly: Mission to Titan August 2022-Present
Embry-Riddle Aeronautical University – Daytona Beach, Florida

- Collaborated with NASA and APL under the New Frontiers program to advance aerodynamic performance for the Dragonfly mission.
- Characterized rotor-rotor and rotor-fuselage interactions in ground effect with overset CFD, identifying aerodynamic instabilities.
- Simulated dust and particle interactions with Lagrangian tracking to assess brownout severity and optimize sensor placements.
- Validated STAR-CCM+ CFD predictions against NASA Langley 14x22 data, reducing uncertainty in aerodynamic databases.
- Reduced CFD cost by an order of magnitude using Gaussian Process Regression surrogate modeling on a 3000+ case aerodatabase.
- Achieved 95% confidence bounds for aerodynamic forces and moments, maintaining validated accuracy against wind tunnel data.
- Applied adjoint-based optimization to design rear aerodynamic fins, reducing yaw moment instabilities to within controllable limits.
- Automated HPC workflows (PBS/SLURM) with Python/MATLAB, accelerating rotorcraft CFD analysis and post-processing throughput.

Atmospheric Flight and Entry Systems Intern – Dragonfly Aeroshell May 2024-August 2024
NASA Langley Research Center – Hampton, Virginia

- Applied NASA's FUN3D solver in supersonic/transonic 1DOF free-to-pitch simulation to study the stability of the Dragonfly aeroshell.
- Performed Fast Fourier Transform to identify dominant frequencies and guide pressure probe placement for ballistic/free-flight tests.
- Generated high-fidelity unstructured grids in Pointwise and HeldenMesh and developed detailed CAD geometries in SolidWorks.
- Supported Python toolchain for FUN3D to automate HPC submissions, convergence evaluation, and auto-generate LaTeX reports.
- Proposed future CFD improvements, including higher-fidelity turbulence models to expand predictive capability for future missions.

Atmospheric Flight and Entry Systems Intern – Trajectory Reconstruction May 2023-August 2023
NASA Langley Research Center – Hampton, Virginia

- Designed a state-estimation framework using an Extended Kalman Filter to predict Mars 2020 heatshield motion post-separation.
- Reconstructed the heatshield trajectory from Rover Downlook Camera images, converting pixel data to corrected world coordinates.
- Applied photogrammetry with CAHVORE lens model to correct distortion and improve accuracy in subsonic blunt-body analysis.
- Adapted NASA's NewSTEP with stochastic and deterministic methods to estimate trajectory, aerodynamic, and atmospheric states.
- Validated reconstructed trajectory against pre-flight data, deriving key parameters such as drag and stability derivatives.
- Identified limitations from resolution and single-camera coverage, proposing methods to reduce uncertainties in future flight analyses.

Atmospheric Flight and Entry Systems Intern – Mars Sample Return Aeroshell May 2022-August 2022
NASA Langley Research Center – Hampton, Virginia

- Analyzed the dynamic stability of the Mars Sample Return Earth Entry Vehicle during forced motion using NASA's FUN3D solver.
- Simulated forced-motion oscillations and compared CFD results against Transonic Dynamics Tunnel (TDT) experimental data.
- Implemented overset grid methods in FUN3D with YOGA to reduce re-gridding and enable efficient drop-in vehicle simulations.
- Quantified a 12% computational overhead for overset approaches, improving overall workflow efficiency for oscillation studies.
- Generated watertight geometries and overset grid in Pointwise/HeldenMesh to support rigid-body motion and overset simulations.
- Contributed to aerodatabase development by analyzing aerodynamic coefficients across varying transonic flight conditions.

Graduate Research Assistant – Osteoporosis under Microgravity October 2021-December 2023
University of Central Florida – Orlando, Florida

- Investigated shear stress and nutrient transport in bone under microgravity to evaluate osteoporosis risks on astronaut health.
- Developed STAR-CCM+ CFD models from micro/nanoCT bone scans and lattice structures to quantify fluid transport interactions.
- Simulated interstitial fluid dynamics under gravity-driven (1Hz) and microgravity (0Hz) to assess remodeling and diffusion.
- Validated CFD results with microfluidic experiments, analyzing shear stress impacts on bone remodeling and nutrient delivery.
- Demonstrated >10x reduction in peak wall shear stress under microgravity, confirming mechanobiological links to osteoporosis.
- Examined fluid-bone interactions to characterize osteoporosis progression and inform mitigation strategies for spaceflight.

Undergraduate Research Assistant August 2020-July 2021

Georgia Southern University – Statesboro, Georgia

- Investigated active flow control on NACA0012 airfoils with synthetic jet actuators using LES, showing stall delay and improved L/D.
- Simulated swirl combustors with radial/axial injection using LES/IDDES, showing radial jets improved mixing and flame stability.
- Modeled supersonic cavity and scramjet combustors with LES to analyze flame stability mechanism and acoustic interactions.
- Generated structured and unstructured meshes in ICEM CFD and ANSYS Fluent to support aerodynamic and reacting-flow simulations.
- Automated CFD workflows on Linux HPC clusters with Bash scripts, reducing manual input and improving computational throughput.

Society of Automotive Engineers – Chapter President and Design Lead December 2018-May 2021

Georgia Southern University – Statesboro, Georgia

- Led a 60+ member SAE chapter, engaging students through competitions, technical forums, and industry networking events.
- Managed budgets and resources while designing, building, and testing Formula and Baja SAE vehicles under engineering constraints.
- Secured $23K+ in corporate and local sponsorships through outreach and fundraising, supporting student engineering projects.
- Optimized braking system design with thermal and fluid analysis, improving cooling efficiency and extending component life cycles.
- Reducing steering and braking system weight by 33% through topology studies, supporting lightweight vehicle design objectives.
- Coordinated K-12 outreach programs, engaging students in STEM education through interactive workshops and engineering projects.

Georgia Power - Sump Pump Design June 2019-May 2020

Georgia Southern University – Statesboro, Georgia

- Collaborated with a 5-member team to validate flow rate, head loss, and power calculations for a sump pump system design.
- Designed a backup electric sump pump for an oil-water separator, replacing pneumatic systems for improved reliability.
- Revised specifications and bill of materials to account for environmental factors affecting flow and pumping performance.
- Developed design solutions to improve system maintenance and accessibility, enhancing long-term operational sustainability.

PROFESSIONAL PUBLICATIONS

- An evaluation of yaw moment driven by rotor-fuselage interactions ***AIAA SciTech***
- An assessment of dragonfly backshell aerodynamics preparing for the initial flight on Titan. ***Acta Astronautica***
- An evaluation of uncertainty for the dragonfly aircraft in the 14-by-22-foot subsonic wind tunnel. ***AIAA Aviation***
- Thermoacoustic instabilities of coaxial jet combustor: computational studies using LES. ***AIAA SciTech***
- Supersonic combustion of scramjet jet cavity with ramp: computational studies using LES. ***AIAA SciTech***
- Computational studies of turbulent reacting flows in rear-wall expansion cavity using LES. ***AIAA Aviation***
- Numerical computations of turbulent swirling reacting flows using IDDES. ***AIAA Aviation***
- Combustion instabilities in backward-step premixed reacting flows: computational studies using LES. ***AIAA SciTech***
- Active flow control for fixed wings using synthetic jets. ***AIAA SciTech***
- Combustion instabilities of swirl combustors with radial and axial air injection schemes. ***AIAA P&E***
- The effects of microgravity on the development of osteoporosis. ***AIAA SciTech***
- The effect of omega-9 on bone viscoelasticity and strength in an ovariectomized diet-fed murine model. ***Nutrients***
- Changes in interstitial fluid flow, mass transport, and the bone cell response in microgravity and normogravity. ***Bone Research***
- Omega-9 modifies viscoelasticity and augments bone strength and architecture in a high-fat diet-fed murine model. ***Nutrients***

AFFILIATIONS AND AWARDS

- NASA 2024 Ames Honor Award – **NFAC Titan Dragonfly PPF Test**
- M-STAR Fellowship (**2x Recipient**) – **NASA Artemis Research Grant**
- 2025 Interplanetary Probe Workshop – **Student Session, 2nd Place**
- Society of Automotive Engineers – **GSU Chapter President**
- American Institute of Aeronautics and Astronautics - **Member**
- American Society of Mechanical Engineers - **Member**

SKILLS

Technical:	**Computer Aided Design:**	**Computational Fluid Dynamics:**	**Mesh Generation:**	**Scripting/Coding:**
3D Printing (FDM/SLA)	SolidWorks	STAR-CCM+	Pointwise	Python, MATLAB, Fortran, Bash
Metal Cutting	AutoCAD	FUN3D	HeldenMesh	**Data Visualization:**
Metal Machining	Geomagic Design X	ANSYS FLUENT	ICEM CFD	Tecplot, ParaView, Excel, R
3D Scanning		ANSYS CFX		

References available upon request.