RAFAEL S. MEZA

PH: (786)-473-5564
College Park, MD 20742 **rmeza@umd.edu**
United States Citizen - *English: Fluent; Spanish: Fluent* www.linkedin.com/in/**rafameza**/

WORK EXPERIENCE:

NASA's Jet Propulsion Laboratory – Extreme Environment Robotics (347C) – EELS Team
"Leader in robotic space exploration into the the solar system and advancing the understanding of our planet." – JPL
Hardware Engineering Intern – Pasadena, CA – Cryogenic Dynamometer Station   *May 2023 – December 2023*

- Final dynamometer testbed is able to characterize actuators at a minimum temperature of -184°C while applying a maximum cross moment of 388 Nm on the output shaft. The design succeeded within 3% of project requirements.
- Conducted structural and thermal analysis on over 20 features designed to withstand high torque load in a cryogenic environment. Ensured operator safety with a 1.5 factor of safety and at least 120% margin on material yields.
- Prioritized systems integration in a sectioned design plan following the V-diagram strategy. Improved material knowledge of stainless steels with low CTE and preloaded bolted joints at extreme temperatures.
- Prepared 24 parts for fabrication with strict GD&T through CNC milling or water jet operations, for a system where shaft alignment and cross moment preload determined success down to 1 thousandth of an inch (0.0254mm).
- Developed a modular containment and deployment mechanism for scientific payloads, compatible with the second generation of the EELS (Exobiology Extant Life Surveyor) robot, environment resistant up to IP68.

Carrier Corporation – HVAC Division
"Carrier is the leading global provider of healthy, safe and sustainable building and cold chain solutions" – Carrier Global
Quality Assurance Engineering Intern / Production Supervisor Intern – Collierville, TN   *May 2022 – August 2022*

- Processed over 700 units as part of the Rework Burndown Project with the goal of eliminating 5,500 units on hold.
- Shipped over 900 units to customers after verifying proper functioning and quality standards of each unit.
- Designed and implemented a new cell design for the Line 1 Pack Out Station, improving process ergonomics.
- Ensured PFMEA was conducted for the new cell design, which reduced the primary issue of unit mislabeling.

EDUCATION:

University of Maryland, A. James Clark School of Engineering   *College Park, MD*
Masters of Science in Mechanical Engineering   *December, 2025*
Graduate Teaching Assistant – ENES 221 Dynamics

Sensors and Actuators Lab – Active Structural State Evaluation Technology
Graduate Research Assistant – College Park, MD – Sensor Technology, Vibrations, and FSI   *Jan. 2024 – Dec. 2025*

- Researching the application of Fiber Bragg Grating (FBG) sensors to measure temperature, strain, and vibrational effects on a compliant panel surface in hypersonic conditions at NASA Langley, Mach 6, blowdown tunnel facilities.
- Conducting vibrational modal analysis experiments with a single point vibrometer excited by an impact hammer. Using Fast Fourier Transform and Power Spectrum analysis to find the six lowest resonance frequencies. To validate ANSYS modal analysis simulation results of the strain mode shapes produced by these six vibrational frequencies.
- Implemented numerical analysis to process sensor network data sets. Decoupling simultaneous strain and temperature measurements through mathematical modeling. Applied hamming filters, gaussian smoothing, and linear regressions.

Florida State University, FAMU-FSU College of Engineering   GPA: 3.75   *Tallahassee, FL*
Bachelor of Science, Mechanical Engineering minoring in Mathematics   *December 15, 2023*
Senior Capstone Project – NASA Heavy Lunar Surface Transport Vehicle - MSFC   *August 2022 – April 2023*

- Designed our project website: https://web1.eng.famu.fsu.edu/me/senior_design/2023/team517/

Teacher Assistant/ Undergraduate Grader – Design and Analysis of Control Systems, Statics, Thermodynamics

Tribology - Undergraduate Research Assistant
Aero-propulsion, Mechatronics, and Energy Lab, Tallahassee, FL   *January 2021- June 2021*

SKILLS / COURSEWORK:
Graduate (M.S.) Coursework

- Dynamics, Measurement/Instrumentation and Analysis, Fluid Structure Interactions, Numerical Methods, Semiconductor Devices and Technology, Applied Machine Learning for Engineering and Design

Design, Programming and Software

- SolidWorks, MATLAB, Python, PTC CREO, C++, JavaScript, LabVIEW, Microsoft Office, ANSYS Modal

Technical Engineering Skills - with applied experience

- FDM Rapid Prototyping, Finite Element Analysis, GD&T, Root Cause Analysis, Design of Control Systems, Six Sigma, Design for Assembly, Systems Integration, Thermal Analysis, Structural Analysis, Modal Analysis