TATIANA A. GUTIERREZ M.

tagutierrez95.github.io | Google Scholar | gutiert6@my.erau.edu

EDUCATION

- **Embry-Riddle Aeronautical University**
  Ph.D in Aerospace Engineering (Dynamics and Control) — *Jan'23 - May 26'*
- **Embry-Riddle Aeronautical University**
  MSc in Aerospace Engineering; GPA: 4.00/4.00 — *Jan'21 - Dec'22*
- **Universidad del Norte**
  B.S Civil Engineering - ABET accredited; GPA: 4.00/5.00 — *Aug'12 - Sept'17*

EXPERIENCE

- **Boeing Commercial Airplanes**
  Primary Flight Controls Engineer — *Feb'21-Present*
  - Lead the Model Coverage Analysis (MCA) efforts to ensure structural coverage compliance for the 737 MAX.
  - Test, debug and develop Detailed Test Procedures (DTP) and System Test Procedures (STP) to validate the implementation of flight control software against Model-Based Requirements (MBRs) for 787-10, 787-9 and 787-8.
  - Cross-functional collaboration to request information and analyze data with other teams such as Flight Controls Integration, Aero Performance and Stability and Control.
  - Focal for the Specification Control Drawing (SCD) for 787 Primary Flight Controls. Hold ERBs, review PFPRs, generate markups and final SCD documents.
  - Write scripts in C language to automate test procedures on simulated and real Integrated Test Vehicle (ITV)
  - Review and approve colleagues' test procedures, pass criteria, and test reports.
  - Mentor new colleagues by guiding them with processes, software use and engineering best practices.

- **Advanced Dynamics and Control Lab (ADCL) Embry-Riddle Aeronautical University**
  Graduate Research Fellow — *Jan'21-Dec'23*
  - Adaptability and problem-solving across different projects, research papers development and mentoring students.
  - Analyzed and designed flight control law methodologies such as adaptive, optimal, feedback and PID for quadcopter, spacecraft and airplane systems. Developed high fidelity models in MATLAB/Simulink.
  - Performed system identification using flight test data in frequency domain and time domain.
  - Tested flight control logics and failures on a real spacecraft test-bed with flight computer and real sensors on board.

- **Insitu Inc. a Boeing Company**
  Software Development Intern — *May'23-Aug'23*
  - Reduced test time by 10% by developing tools on MATLAB/Simulink to improve model robustness such as converting +30 configurable subsystems blocks into variable subsystems blocks based on airplane model and specific functionality.
  - Implemented in MATLAB a GPS degradation logic by reducing the number of available satellites when GPS signal is weakened.
  - Compiled code using Visual Studio compiler and managed team files and scripts using Version Control Systems: GIT, SourceTree, Jira, Bitbucket.

- **Universidad del Norte**
  Analyst Engineer — *Jan'20-Dec '20*
  - Processed geografical information systems (GIS) data obtained from satellite imagery to quantify patterns and relationships in the data and display the results as maps, tables, and charts.
  - Performed statistical analyses over data using regression and least squares techniques to extract spatial patterns and identify trends.

- **Royal Consulting Services - Internship**
  Assistant Engineer — *Jan'19 - Aug'19*
  - Performed surface water and groundwater modeling analyses using ArcGIS software and analyzed statistical properties of hydrologic records in the State of Florida.
  - Performed UAV flights with drone to gather aerial data for availability of resources, scheduling and project progress.

RESEARCH EXPERIENCE

- **NASA Jet Propulsion Laboratory (JPL) and ERAU Collaboration**
  Graduate Researcher *May'22 - May'23*
  - Developed a simulation environment in MATLAB/Simulink for testing novel attitude controllers to analyze control performance and robustness during failure scenarios. Processed data from real missions provided by NASA.
  - Held progress meetings with researchers from the Multi-Agent Autonomy group at NASA's Jet Propulsion Laboratory and authored a research paper. [paper]

- **Federal Aviation Administration (FAA) and ERAU Collaboration**
  Graduate Researcher *Jan'21 - May'22*
  - Designed a high fidelity simulation environment to support the validation and verification of GNC strategies applied to drone operations during GPS denied scenarios in Urban Environments.
  - Authored and co-authored two research papers and presented findings at AIAA SciTech Conference: [paper 1,paper 2]

THESIS

1. Health Management and Adaptive Control of Distributed Spacecraft Systems [Thesis]
   Tatiana Gutierrez. *Embry-Riddle Aeronautical University - M.Sc. in Aerospace Engineering* 2022.

PUBLICATIONS

1. Robotic Spacecraft Testbed for Validation and Verification of AI-Attitude Controllers. [paper]
   Leon, S., **Gutierrez, T**., Moncayo, H. *AIAA SciTech*. 2024.
2. Distributed Health Management for Resilient Multi-agent Collaborative Spacecraft Inspection. [paper]
   Gutierrez, T., Coulter, N., Moncayo, H., Nakka, Y., Choi, C., Rahmani, A. and Gupta, A. *AIAA SciTech*. 2023.
3. Modeling of GPS Degradation Conditions for Risk Assessment of UAS Operations in Urban Environments. [paper]
   Cuenca, A., **Gutierrez, T**., Morillo, E., Steinfeldt, B. and Moncayo, H. *AIAA SciTech*. 2023.
4. Development of a Simulation Environment for Validation and Verification of Small UAS Operations. [paper]
   Gutierrez, T., Cuenca, A., Coulter, N., Moncayo, H. and Steinfeldt, B. *AIAA SciTech*. 2022.
5. Distributed Intelligent Adaptive Controller for Disturbance Rejection in Multiagent Systems. [paper]
   D.F., Moncayo, H., Aoun, C. and **Gutierrez, T**. *Journal of Aerospace Information Systems*. 2022.
6. Comparison of an Adaptive-Immunized and an Adversarial Deep Learning Control Laws to Increase Resiliency in Distributed Cyber-Physical Systems. [paper]
   D. F., Moncayo, H., Aoun, C. and **Gutierrez, T**. *AIAA SciTech*. 2022.

SKILLS

- **Technical:** MATLAB, Simulink, Python, C++, PSIM
- **Software:** GIT, Jira, Bitbucket, Visual Studio, BASH, Linux
- **Soft Skills:** Leadership, Collaboration, Communication, Problem-Solving, Adaptability, Mentorship and Community Engagement.

LEADERSHIP, INVOLVEMENT AND VOLUNTEERING

- Society of Women Engineers in Colombia (ACMA), a non-profit for promoting the STEM field - Mentored young engineers, improving retention in STEM fields.
- BOEING Familia, an internal community group - Actively volunteer in outreach STEM events for students.
- Adopta Animalitos, a non-profit to rescue street dogs and cats in Colombia - Founded this organization in 2020 to help find homes for animals in Colombia.
- Society of Women Engineers (SWE) - Active member
- American Institute of Aeronautics and Astronautics (AIAA) - Active member

ACHIEVEMENTS

- Travel award for visiting NASA Jet Propulsion Laboratory in Pasadena, CA. Awarded to top 20 applicants. (May'23)
- Travel award for visiting General Electric Aerospace Summit in Cincinnati, OH. Awarded to top 50 applicants. (Jul'23)
- Graduate Research Fellowship (GAANN). Awarded by U.S Department of Education. (Aug'22-Dec'23)
- Obtained Remote Pilot License Part 107- FAA. (Jun'19)
- Obtained the Engineer in Training Certification (EIT). Awarded by NCEES. (Dec'18)
- Honorable Mention in Latin American Astronomy and Astronautics Olympiad held in Brazil (Nov'11)