TATIANA A. GUTIERREZ M.

tagutierrez95.github.io | tatiana.gutierrez@boeing.com

EDUCATION

- **Embry-Riddle Aeronautical University**
  Ph.D in Aerospace Engineering (Dynamics and Control) *Jan'23 - May 26'*
- **Embry-Riddle Aeronautical University**
  M.Sc in Aerospace Engineering; GPA: 4.00/4.00 *Jan'21 - Dec'22*
  Thesis: Health Management and Adaptive Control of Distributed Spacecraft Systems
- **Federal Aviation Administration (FAA)**
  Remote Pilot License Part 107 *Jun'19*
- **Universidad del Norte**
  B.S Civil Engineering GPA: 4.00/5.00 *Aug'12 - Sept'17*

PROFESSIONAL EXPERIENCE

- **Boeing Commercial Airplanes**
  Primary Flight Controls Engineer *Feb'24-Present*
  - Lead Model Coverage Analysis (MCA) efforts to ensure comprehensive testing and validation of control law logic for the certification of the 737-10 MAX, utilizing Boeing-developed MATLAB/Simulink functions.
  - Test, debug and develop Detailed Test Procedures (DTP) and System Test Procedures (STP) to validate the implementation of flight control software as part of the Common Block Point regression testing for 787-10, 787-9 and 787-8.
  - Focal for the Primary Flight Controls Specification Control Drawing (SCD) documents: Sheet03 SCD and Red Label SCD, which outline software design requirements for Boeing and suppliers.
  - Develop scripts in C language to automate test procedures on both simulated and real hardware using the Integrated Test Vehicle (ITV).
  - Cross-functional collaboration to request information and analyze data with other teams such as Flight Controls 777-X, Flight Controls Integration, and Stability and Control.
  - Review and approved test procedures, pass-fail criteria, and test reports submitted by colleagues to ensure compliance with standards.
  - Mentor a new team member from the ECFP program as a 'buddy', providing guidance on DTP test procedures, version control, and software and engineering best practices.
- **Advanced Dynamics and Control Lab (ADCL) Embry-Riddle Aeronautical University**
  Graduate Research Fellow *Jan'21-Dec'23*
  - Designed and implemented adaptive, optimal, and feedback-based control laws in MATLAB/Simulink for performance analysis of quadcopter, spacecraft, and aircraft systems under failure and disturbance conditions.
  - Conducted testing of Guidance, Navigation, and Control (GNC) algorithms on a real spacecraft testbed, integrating flight computer systems and real sensor hardware onboard to validate system performance.
  - Developed research in safety control, machine learning, and fault tolerance for aerospace systems and presented findings at AIAA conferences, showcasing advancements in the aerospace field.
- **Insitu Inc. a Boeing Company**
  Software Development Intern *May'23-Aug'23*
  - Achieved a 10% reduction in test time by developing MATLAB/Simulink tools to enhance model robustness, including the conversion of over 30 configurable subsystem blocks into variable subsystem blocks tailored to specific airplane models and functionalities.
  - Implemented GPS degradation logic in MATLAB to simulate reduced satellite availability during weakened GPS signals, improving the accuracy of flight control simulations
- **Universidad del Norte**
  Analyst Engineer *Jan'20-Dec '20*
  - Processed geografical information systems (GIS) data obtained from satellite imagery to quantify patterns and display the results as maps, tables, and charts.
  - Conducted statistical analyses to extract spatial patterns and identify trends from complex datasets.
- **Royal Consulting Services - Internship**
  Assistant Engineer *Jan'19 - Aug'19*
  - Conducted groundwater modeling analyses utilizing ArcGIS software.
  - Executed UAV drone flights to collect aerial data, facilitating resource availability assessments, project scheduling, and progress monitoring.

RESEARCH EXPERIENCE

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

- **Federal Aviation Administration (FAA) and ERAU Collaboration**
  Graduate Researcher *Jan'21 - May'22*
  - Designed a high-fidelity simulation environment to facilitate the validation and verification of Guidance, Navigation, and Control (GNC) strategies for drone operations in GPS-denied urban environments.

SKILLS

- **Technical:** MATLAB, Simulink, Python, C++, PSIM, FCDAT and Boeing Internal Tools
- **Software:** GIT, Jira, Bitbucket, Visual Studio, Git Bash, Linux
- **Soft Skills:** Leadership, Collaboration, Communication, Problem-Solving, Mentorship and Community Engagement.

LEADERSHIP AND VOLUNTEERING

- **Boeing Career Mentorship Program (BCMP)**
  6 months guided mentorship for 1 Embry-Riddle intern. *Starts Jun 25'*
- **Society of Women Engineers in Colombia (ACMA)**
  Mentor for promoting the STEM field among young women engineers *Jun 21'-Present*
- **Boeing FAMILIA Affinity Group**
  Actively volunteer in outreach STEM events for students. *Jun'24-Present*
- **Adopting Small Animals Foundation**
  Founder for non-profit to help rescue and find homes for street dogs and cats in Colombia. *Jun 2020'*

AWARDS

- **Travel award for visiting NASA Jet Propulsion Laboratory**
  1 week technical visit to Pasadena, CA, awarded to top 20 applicants. *Mar 23'*
- **Travel award for visiting General Electric (GE) Aerospace**
  4 day technical visit to GE headquarters in Cincinnati, OH, awarded to top 50 applicants. *May 23'*
- **Graduate Research Fellowship (GAANN)**
  Awarded by U.S Department of Education *Aug'22-Dec'23*
- **Latin American Astronomy and Astronautics Olympiad**
  Honorable Mention in Academic Contest held in Brazil *Nov'11*

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.