TATIANA A. GUTIERREZ M.

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EDUCATION

- **Embry-Riddle Aeronautical University**
  Ph.D in Aerospace Engineering (Dynamics and Control) — *Aug'21 - (Paused) Dec 23'*
- **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*
  - Perform control law and performance analysis tests in both desktop simulation and hardware in the loop to verify requirements
  - Write high quality technical documentation of programs, algorithms, or analysis
  - Experience with C++, Python, MatLab, GIT for code development and version control
  - Generate documentation used by suppliers with software specifications and updates.

- **Advanced Dynamics and Control Lab (ADCL) Embry-Riddle Aeronautical University**
  Graduate Research Fellow — *Jan'21-Dec'23*
  - Analyzed and designed flight and attitude control laws for quadcopters, spacecraft and aircraft.
  - Developed models in MATLAB/Simulink for testing GNC models and tools.
  - Used least squares methods to identify system models from flight test data.
  - Performed frequency domain and time domain analysis in MATLAB/Simulink to assess system stability characteristics.
  - Integrated hardware and software for testing and validation of algorithms in quadcopter systems and spacecraft.
  - Knowledge and background in classical and modern control theory

- **Insitu Inc. a Boeing Company**
  Software Development Intern — *May'23-Aug'23*
  - Developed support tools on MATLAB/Simulink that converted configurable subsystems into variable subsystems, improving the UAV Integrator simulation model.
  - Implemented a GPS degradation logic in MATLAB/Simulink by reducing the number of available satellites and created control buttons in User Interface using C++ and C#.
  - Compiled code using Visual Studio and managed files and tasks using Version Control Systems: SourceTree, Jira, Bitbucket.

- **Universidad del Norte**
  Analyst Engineer — *Jan'20-Dec '20*
  - Used Geographic Information Systems (GIS) to process and manipulate remote sensing data and satellite imagery.
  - Performed statistical analyses over environmental data using regression and least squares techniques.

- **Royal Consulting Services - Internship**
  Assistant Engineer — *Jan'19 - Aug'19*
  - Performed engineering analyses from GIS data and assisted with take-offs calculations.
  - Performed UAV flights with commercial DJI Phantom drone to gather aerial data.

RESEARCH EXPERIENCE

- **NASA Jet Propulsion Laboratory (JPL) and ERAU Collaboration**
  Graduate Researcher *May'22 - May'23*
  - Created a modular simulation environment in Simulink to simulate multi-spacecraft missions, test different attitude controllers, process flight data at normal and abnormal conditions and test failure and disturbance scenarios.
  - Processed trajectory data and applied a fault detection framework in Python.
  - Authored a research paper and presented findings at AIAA SciTech Conference 2023: [paper]

- **Federal Aviation Administration (FAA) and ERAU Collaboration**
  Graduate Researcher *Jan'21 - May'22*
  - Assisted in the design and integration of a simulation environment to support validation and verification of GNC strategies applied to UAV operations during GPS denied scenarios in Urban Environments.
  - Authored and co-authored two research papers and presented findings at AIAA SciTech Conference 2022-2023: [paper 1,paper 2]

THESIS

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

PUBLICATIONS

1. Robotic Spacecraft Testbed for Validation and Verification of AI-Attitude Controllers. (Pending publication)
   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

- **Engineering Software:** MATLAB, Simulink, Python, C++, C#, HTML, AutoCAD, GIS, Visual Studio, GIT, SourceTree, Bitbucket, Jira, LaTex, Linux
- **Equipment:** IMU, GPS, Arduino, CrazyFlie, microcontrollers, battery checkers, soldering.
- **Teaching:** Graduate teaching assistant for:
  Spacecraft Control AE 434 (Fall'22) and Experimental Dynamics and Control Lab AE 443 (Spring'21)

LEADERSHIP AND INVOLVEMENT

- SWE - Society of Women Engineers - Member
- AIAA - American Institute of Aeronautics and Astronautics - Member
- Journal of Aerospace, Science and Technology - Reviewer
- ACMA - Society of Women Engineers in Colombia - Mentor
- CSU - Catholic Student Union - Member of Hospitality team.

ACHIEVEMENTS

- Travel Scholarship for General Electric Aerospace Diversity Summit. Awarded to top 50 applicants nationwide. (Jul'23)
- Travel Scholarship for visiting research center NASA Jet Propulsion Laboratory. Awarded to top 20 applicants. (May'23)
- Graduate Research Fellowship (GAANN). Awarded by U.S Department of Education. (Aug'22-Present)
- 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)