Gabriel Rodriguez

Miami, FL, USA
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Education

Embry-Riddle Aeronautical University, Daytona Beach, FL, Aug 2020 – Exp. May 2025
B.S. Aerospace Engineering, Aeronautics & B.S. Engineering Physics, Spacecraft Systems
Minor: Applied Mathematics
GPA: 3.955/4.000
Student Athlete, Varsity Baseball (2020-2022)

Research Experience

Undergraduate Research Intern, Engineering Physics Propulsion Laboratory, Embry-Riddle Aeronautical University, Physical Sciences Department, Daytona Beach, FL
January 2024 – Present
Research Advisor: Dr. Sergey Drakunov

- Received $15,000 in funding for developing an autonomous, AI-powered system capable of conducting power plant diagnostics and reports using a Unitree Go2 EDU quadruped, added sensors, and Jetson devices.
- Developed a ROS2 workspace for deploying low-level (locomotion) and high-level (navigation) control policies with Python and C++ packages, training all policies through massively parallel reinforcement learning with Isaac Lab.
- Collaborated with team members to implement Nav2 using LiDAR and camera data, for autonomous 2D navigation.
- Created lab LinkedIn, website, and GitHub Organization for project demonstration and public visibility.

Undergraduate Research Intern, Engineering Physics Propulsion Laboratory, Embry-Riddle Aeronautical University, Physical Sciences Department, Daytona Beach, FL
May 2023 – August 2023
Research Advisor: Dr. Sergey Drakunov, Dr. John Hughes

- Developed an autonomous, AI-powered, omnidirectional vehicle leveraging low-latency inference on the Jetson Nano and low-cost hardware.
- Authored a PID control algorithm in Python to maneuver the vehicle based on input from the AI object detection system to successfully capture a free-falling object, solely using image data.
- Conceived, modeled, and 3D printed various parts and mechanisms to house hardware and object capture systems.

Industry Experience

Mechanical Engineering Co-Op, Texton Systems, Wilmington, MA
September 2023 – December 2023

- Developed detailed 3D models of mechanical components using Siemens NX, focusing on Product Manufacturing Information (PMI) and Geometric Dimensioning and Tolerancing (GD&T).
- Strengthened proficiency in ANSYS through hands-on experience with linear static analysis.
- Gained exposure to nonlinear analysis, enhancing my understanding of material behavior under complex loads.
- Transitioned legacy 2D drawings to modern 3D models, updating outdated specifications and integrating current engineering standards. Developed engineering intuition regarding material tolerances and welding practices.

Boeing Career Mentorship Program Mentee, The Boeing Company, Daytona Beach, FL
May 2022 – November 2022

- Participated in the Boeing Career Mentorship Program, enabled connections with multiple Boeing employees in interested fields.
- Developed professional skills like conducting informational interviews, networking, and communicating effectively.
- Deepened understanding of professional development and industry trends.

Academic Project Experience

Principal Investigator, Aerospace Engineering Senior Design, Embry-Riddle Aeronautical University, Daytona Beach, FL
August 2024 – Present

- Directed the conceptual and preliminary design of VerdeCommute VC-1, a hybrid-electric short take-off and landing (STOL) aircraft for regional air mobility markets.
- Designed and implemented a MATLAB-based algorithm to optimize high-lift propeller sizing, placement, and thrust modeling, incorporating lift augmentation effects using a surrogate model developed by NASA's SCEPTOR project.
- Investigated systems integration of key components, including electric motors, turbogenerator, batteries, and motor controllers, to ensure optimal performance and compatibility.

Software and Communications Engineer, Engineering Physics Senior Design, Embry-Riddle Aeronautical University, Daytona Beach, FL
August 2024 – Present

- Engineered software architecture for ToppleBot, an autonomous reaction-wheel-driven balancing cube, focusing on scalable control algorithms and user-friendly deployment.
- Developed a wireless communications framework using micro-ROS to enable real-time communication between the onboard microcontroller and IMU and the control station.
- Utilized RViz to display the cube's current orientation for demonstration purposes.

University Service

Academic Chair, Society of Hispanic Professional Engineers Las Aguilas Chapter, Daytona Beach, FL
May 2023 – May 2024

- Led educational research meetings, introducing members to research opportunities for undergraduates.
- Planned and managed various events to provide supplementary instruction to members in MATLAB and 3D printing.

Laboratory and Technical Skills

ROS2, Linux, Inventor, Siemens NX, MATLAB (advanced proficiency), ANSYS, Femap, Python (advanced proficiency), Git, Simulink, CATIA v5, Unitree Go2, SolidWorks, C/C++ (intermediate proficiency), Nav2, Isaac Lab/Gym

Selected Honors and Awards

Dean's List, Embry-Riddle Aeronautical University, All Semesters
Scholar-Athlete Award, Embry-Riddle Aeronautical University, 2022
Diamond Eagle Scholarship, Embry-Riddle Aeronautical University, 2020