Carlos A. Carrasquillo Torres

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Education

Georgia Institute of Technology | GPA: 3.9 / 4.0 **Aug 2021 – Present**

- PhD, *Robotics* Expected Spring 2026
- Master of Science, *Computer Science*, Machine Learning Specialization May 2025
- Master of Science, *Aerospace Engineering* May 2025

University of Florida | GPA: 3.7 / 4.0 **Aug 2017 – May 2021**

- Bachelor of Science, *Mechanical Engineering*, Magna Cum Laude Honors May 2021
- Bachelor of Science, *Computer Engineering*, Magna Cum Laude Honors May 2021

Experience

Graduate Research Assistant | Georgia Institute of Technology, Institute for Robotics and Intelligent Machines **Aug 2021 – Current**

Advisors: Anirban Mazumdar, PhD; Aaron Young, PhD

- Developed and validated novel exoskeleton controllers, including impedance-based, primitive-based, uncertainty-aware, and end-to-end biological torque controllers.
- Designed mechatronics components, including PCBs, sensor drivers, and orthoses components for several exoskeletons.
- Applied deep learning techniques (TCNs, VAEs, CNNs, GANs, Transformers, PPO) to estimate human motion, biological moments, and other physiological states.
- Built real-time exoskeleton software, including multiprocessing controller frameworks, communication packages, and GUIs.
- Created VR/AR games in Unity to provide real-time biofeedback and simulate unstructured environments for human studies.
- Conducted human-subject experiments using Delsys EMG, Vicon motion capture, Parvo and COSMED metabolic systems, HTC Vive Pro and Meta Quest 3S headsets.

Software & Mechanical Engineering Intern | RTX **May 2021 – Apr 2023**

- Developed a MERN stack web application that streamlined component discovery on printed circuit boards for engineers.
- Designed and deployed five process programs and Splunk dashboards to monitor and optimize production-grade machinery.
- Automated a manual material testing process by building a VBA-based application, improving data logging and tracking efficiency.

Undergraduate Research Assistant | University of Florida Dept. of Mechanical and Aerospace Engineering **Jan 2019 – Aug 2021**

Advisor: Riccardo Bevilacqua, PhD

- Developed embedded C++ avionics software for the D3 CubeSat, creating custom libraries to interface with the satellite's IMU, antenna, radio, and GPS on a BeagleBone Black microcomputer.
- Developed a Python-based ground station application to manage satellite mission operations, enabling reliable telecommand transmission and downlink data acquisition.

Undergraduate Teaching Assistant | University of Florida Dept. of Mechanical and Aerospace Engineering **May 2019 – May 2021**

- **Design and Manufacturing Lab (6 semesters):** Taught >30 students on design for manufacturing principles and usage of shop equipment.
- **Dynamics and Controls Lab (1 semester):** Lectured to >50 students on applying classical control theory to real-world systems.
- **Thermal Systems and Design Lab (1 semester):** Guided student teams in designing models for internal combustion engines.
- **Numerical Methods (2 semesters):** Lectured on iterative algorithms, linear algebra, Fourier analysis and held routine office hours.

Skills

- **Design & Manufacturing:** Altium Designer (PCB), SolidWorks (CAD, FEA), Fusion 360 (CAD/CAM), Machine Shop Equipment (Lathes, Mills, CNC, Welding), Rapid Prototyping
- **Programming:** Python (NumPy, Pandas, OpenCV, PyTorch, TensorFlow, ROS/ROS2, OpenMDAO), C/C++, C# (Unity), JavaScript (React.js, MongoDB, Express.js, Node.js), MATLAB, Simulink, VBA, VHDL
- **Experimentation:** AR/VR, Electromyography, Metabolics (COSMED, Parvo), Motion Capture (Vicon), OpenSim
- **Miscellaneous Projects:** reinforcement learning-based aircraft landing autopilot, microprocessor knee recommendation algorithm, bioreactor pump controller, 12-degree-of-freedom quadruped robot, 3D bioprinter, desktop lathe, MIPS CPU, assortment of websites
- **Certifications:** Amateur Radio Technician (2019, KN4ZUC), SolidWorks Associate (2020), Private Pilot (90+ hours)
- **Languages:** English and Spanish

Fellowships and Awards

- Grad REACH Scholar **Aug 2024 – Current**
- Pathbreakers Fellow (formerly University Center of Exemplary Mentoring) **Aug 2023 – Current**
- National Defense Science and Engineering Graduate (NDSEG) Fellow **Aug 2023 – Aug 2025**