Carlos A. Carrasquillo Torres

(787) 668-8096 | ccarrasquillo3@gatech.edu | www.carloscarras.tech | U.S. Citizen

Education

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

- PhD Candidate, *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 Fellow | Georgia Institute of Technology, Institute for Robotics and Intelligent Machines **Aug 2021 – Current**

Advisors: Anirban Mazumdar, PhD; Aaron Young, PhD

- Designed and implemented real-time closed-loop control systems for highly non-linear, multi-DOF wearable robotic platforms for unstructured and dynamic activities while enforcing strict safety constraints.
- Developed model-based and data-driven exoskeleton controllers, including impedance, adaptive, and end-to-end torque controllers, and validated on hardware in 200+ human-in-the-loop experiments.
- Performed state estimation using extended Kalman filters to infer latent system states from noisy, partially observed sensor data.
- Conducted trajectory planning for both human locomotion and 6-DOF aircraft models.
- Deployed deep learning-based models (TCNs, VAEs, CNNs, Transformers, PPO) for state estimation into exoskeleton control stacks.
- Designed and implemented mechatronic hardware, including custom PCBs, sensors, and actuators, and validated in hardware tests.
- Built real-time exoskeleton software, including multiprocessing controller frameworks, communication packages, and GUIs.
- Developed AR/VR games in Unity and conducted human-subject studies with real-time biofeedback using EMG and motion capture.

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

- Developed a web application that streamlined component discovery on printed circuit boards for engineers.
- Designed and deployed assembly line programs and dashboards to monitor and optimize production-grade machinery.
- Automated a manual material testing process by building a desktop 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 an Ubuntu microcomputer. Developed a Python-based ground station application to manage satellite communications.
- Designed satellite circuit boards and CNC-machined parts for custom actuators.

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

- **Programming:** Python (NumPy, Pandas, OpenCV, PyTorch, TensorFlow, ROS/ROS2, OpenMDAO), C/C++, C# (Unity), High-Performance Computing (HPC), JavaScript (React.js, MongoDB, Express.js, Node.js), MATLAB, Simulink, VBA, VHDL
- **Design & Manufacturing:** Altium Designer (PCB), SolidWorks (CAD, FEA), Fusion 360 (CAD/CAM), Machine Shop Equipment (Lathes, Mills, CNC, Welding), Rapid Prototyping
- **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 (100 hours)
- **Languages:** English and Spanish

Fellowships and Awards

- Georgia Space Grant Consortium Fellow **Aug 2025 - Current**
- Grad REACH Scholar **Aug 2024 – Current**
- National Defense Science and Engineering Graduate (NDSEG) Fellow **Aug 2022 – Aug 2025**
- Pathbreakers Fellow (formerly University Center of Exemplary Mentoring) **Aug 2023 – May 2025**