GEORGE ORTIZ

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EDUCATION

Carnegie Mellon University   May 2027
Master of Science in Mechanical Engineering – Research, GPA: 4.0/4.0
Stevens Institute of Technology   Graduated May 2025
Bachelor of Engineering – Mechanical Engineering: Robotics Concentration, GPA: 3.75/4.0

RESEARCH

Robotics Researcher, Robomechanics Lab   August 2025 - Present
- Train **Reinforcement Learning Policy** for quadruped locomotion through non-Newtonian fluids, optimizing for speed, stability and energy efficiency in deep mud.
- Implement **sim-to-real** learning control framework on the **Unitree GO2** robot, evaluating the model for efficiency.
- Migrate MATLAB-based plotting tools into **Python** framework, enabling **ROS2** compatibility to streamline data visualization for quadruped joint trajectories and states for **QuadSDK**.

Robotics Researcher, PROOF Lab   February 2023 - May 2025
- Developed **object detection** algorithm for Doosan H2515 collaborative robot with **YOLOv8** and **OpenCV** in **Python,** classifying and locating objects to enhance robot task execution.
- Parameterized space and developed a **mapping** algorithm to automate **pick-and-place tasks** with millimeter precision, making functions for **path planning** and accelerating robotics research.
- Created **Python**-based **client-server** architecture using **sockets** in an IoT setup, emulating **TCP** communication which improved reliability and simplified robot-computer interaction.

WORK EXPERIENCE

Manufacturing Engineer Intern, Zimmer Biomet Holdings   May 2024 - August 2024
- Created a fixture **in Siemens NX** using **GD&T** to maximize safety after identifying a manual operation hazard.
- Investigated and managed large datasets in scrap data and designed a dashboard in **Power BI**, enabling management to analyze scrap data with **real-time analysis** and reduced manual reporting time by **40%**.
- Recognized challenges with fixture setup at **laser etch** operation, made programs for over **100-part families** in DELMIA, embedded visual aids which increased clarity, and reduced training time.

Quality Engineer Co-op, Zimmer Biomet Holdings   September 2023 - December 2023
- Conducted time studies and **Quality Standard Reference (QSR)** updates for an inspection reduction project, resulting in **$40,000** in annual cost savings.
- Owned and completed an **A3 project** for cases containing excessive errors made by operators, checking to ensure error rate was within a reasonable margin.

ROBOTICS PROJECTS

Soft Exosuit for Spinal Muscular Atrophy (SESMA 3.0)   ME Capstone Project
- Addressed muscle weakness caused by Spinal Muscular Atrophy, improving mobility for affected users by **10%**.
- Programmed microcontroller and integrated **PID compensation** in **C++** to monitor sit-to-stand transitions for real-time **feedback** and **control**.
- Collected and analyzed data in MATLAB with **3D splines** for **curve fitting** to calculate changes in cable length, optimizing clutch release for maximum knee torque assistance.

Signature SO-100 Robot Manipulator   LeRobot Arm Hackathon NYC
- Separated **mechanical and electrical noise** of potentiometer outputs using leader and follower paths and ran **low pass filter** through the noise to smooth trajectory, accelerating tasks with a **200% speed increase.**
- Trained a robot arm to autonomously pick up a pen from anywhere within the workspace, draw on a piece of paper, and place a pen down through an **Action Chunking Transformer (ACT) Policy**.
- Won $1000 prize for "Most Innovative Use of Data".

Hand Squeezing Rehabilitation Device
- Coded **PIC16F88 microcontroller** to integrate sensors, actuators, and an encoder; debugged and wired system for seamless functionality.
- Designed a **four-bar linkage system** to provide tension to a band with adjustable force, controlled through a **potentiometer** for precise tuning.

SKILLS

Robotics: Forward/Inverse Kinematics, Model Predictive Control, SLAM, RRT, Extended Kalman Filters, Jacobian
Programming Languages: Python, C, C++, MATLAB, PICBasic Pro
Software and Frameworks: IsaacLab, ROS2, Gazebo, MuJoCo, YOLOv8, OpenCV, PyTorch