

# DEREK CHIBUZOR

Los Angeles, CA | 201-316-3229 | [derekchibuzor777@gmail.com](mailto:derekchibuzor777@gmail.com) | [linkedin.com/in/derekchibuzor](https://linkedin.com/in/derekchibuzor) | [derekc22.github.io](https://derekc22.github.io)

## EDUCATION

### University of Southern California

Los Angeles, CA

#### Master of Science in Mechanical Engineering

August 2025-May 2026

\* GPA: NA/4.00 | Mechatronic Systems, Robot Dynamics & Control, Linear Systems, Flight Vehicle Stability & Control

#### Bachelor of Science in Aerospace Engineering

August 2021-May 2025

\* GPA: 3.62/4.00 | Computer-aided Design, Dynamic Systems, Linear Control, Computational Methods, Flight Mechanics

## WORK EXPERIENCE

### Dynamic Robotics and Control Laboratory

Los Angeles, CA

#### Robotics Software Engineer

January 2025-Present

- \* Developed IK joint-space PD controller for 16-DOF robot, enabling leg trajectory data generation for system identification tasks.
- \* Engineered system identification framework for Sim2Real transfer via gradient- and sampling-based hybrid optimization.
- \* Trained evolutionary algorithms and residual physics networks to model actuator dynamics for 24-DOF robot, reducing error by 78%.
- \* Constructed diffusion model framework for generating full-body loco-manipulation trajectories from Unitree G1 motion capture data.
- \* Built and conducted hardware testing for Intel RealSense T265 ROS2 package to publish pose, velocity, and acceleration data.
- \* Led systems integration, testing, and hardware deployment of Sim2Real workflow for 18-DOF robot locomotion controller.

### Lawrence Livermore National Laboratory

Livermore, CA

#### Computational Engineer Intern

June 2025-August 2025

- \* Developed joint-space and task-space controllers for 6-DOF UR3e arm, enabling simulated manipulation of laboratory hardware.
- \* Wrote IK task-space PD controller, saving 5+ hours of manual path programming while achieving sub-0.1 mm tracking error.
- \* Trained reinforcement learning policies for pick and place tasks, reducing episode length by 20% with transformer feature extractor.
- \* Utilized implicit and explicit structural dynamics codes to conduct modal analysis of Brake-Reuss beam subject to broadband excitation.
- \* Conducted FEA simulations to characterize nonlinear response of hyperelastic elastomer models under variable preload conditions.

### Northrop Grumman

Roy, UT

#### Mechanical Engineer Intern

June 2023-August 2024

- \* Constructed 2-DOF reduced-order Simulink model of shock-isolated structure, saving 240 hours of full-scale FEA computation.
- \* Wrote post-processing scripts to characterize transient responses of 5 subterranean structures subject to 11 seismic excitations.
- \* Designed and performed FEA on 2 access door CAD assemblies in accordance with MIL-STD-1472G human engineering criteria.
- \* Evaluated CAD model of elastomeric isolator designed for seismic shock and vibration attenuation within subterranean structures.
- \* Surveyed metal dichalcogenide lubricants to reduce shock isolator friction by 50% while retaining durometer and compressive modulus.

### Amazon & Information Sciences Institute

Los Angeles, CA

#### GNC Engineer Intern

June 2022-August 2022

- \* Developed vision-based navigation software, enabling 3-DOF pose estimation for CLINGERS rendezvous proximity operations (RPO).
- \* Achieved sub-160 ms latency localization and tracking of 12 infrared LED targets up to 2.50 m from Raspberry Pi NoIR camera.
- \* Implemented adaptive tuning of LED detection parameters (e.g., circularity, inertia, area) to ensure far- to near-field tracking continuity.

## SKILLS & CREDENTIALS

\* **Engineering:** Siemens NX, Simulink, LabVIEW, Abaqus, DYNA3D

\* **Other:** PyTorch, MuJoCo, JAX, OpenCV, Gymnasium, Stable-Baselines3, ROS2, CasADi

\* **Programming:** Python, C++, MATLAB, Java, JavaScript

\* **Skills:** Robotics, Dynamics, Control, GNC, Optimal Control, Trajectory Optimization, System Identification, CAD, GD&T, FEA

## PROJECTS

\* **Multi-Agent MPC:** Distributed and decentralized model predictive control (DMPC) for 6-DOF multi-agent systems.

\* **Bipedal Robot:** Extended Kalman filter (EKF) and various controllers (e.g., LQR, MPC, I/O linearization) for 7-DOF bipedal robot.

\* **Dual-Axis Control System:** Sun-seeking, multithreaded, 2-DOF electromechanical solar array articulation module for 3U CubeSat.