

# Jose Sanchez Gonzalez

## Robotics / Machine Learning Engineer

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## Summary

Robotics engineer with an M.S. in Artificial Intelligence. Develops metric depth pipelines, simulation environments, and learned control policies; combines synthetic-data evaluation with hands-on actuator assembly and calibration.

## Technical Skills

**Languages and Learning:** Python, C++, C, PyTorch, computer vision, imitation learning

**Perception:** RGB-D, stereo depth, DINOv2, camera calibration, OpenCV, synthetic data

**Simulation and Control:** Isaac Sim, Isaac Lab, MuJoCo, PhysX, OpenUSD, Blender, PPO, inverse kinematics

**Engineering:** ROS 2, Docker, ONNX Runtime, FastAPI, Linux, Git, Slurm, CAD, actuator calibration

## Projects

### SPUR: Metric Depth for Robotic Pruning | PyTorch, DINOv2, FastAPI

- Built Blender synthetic-data pipelines with RGB, depth, segmentation masks, and camera calibration; evaluated monocular and multi-view models under a fixed 10-tree, 5-seed validation protocol.
- Reduced synthetic validation depth RMSE from 0.0550 m to 0.0445 m (19%) using DINOv2 RGB-D refinement across three stereo pairs; reported seed variation of 0.0057 m.
- Packaged inference in a Docker/FastAPI service with split ONNX export; benchmarked the PyTorch refiner at 156 ms p50 on a V100 (FP16, six precomputed-depth views).

### Humanoid Robustness Ladder | Isaac Lab, MuJoCo, PPO, ONNX

- Built a headless simulation-to-simulation evaluation harness using the upstream deployment controller; automated policy export, domain-randomization sweeps, and MuJoCo rollout metrics.
- Evaluated five randomization settings over 450 MuJoCo episodes; measured 23.3% falls without randomization versus 0% for the default setting across 90 episodes per setting.

### Isaac Sim Pruning Workflow | Isaac Sim, PhysX, Python

- Built a UR5e simulation environment with differential inverse kinematics, contact sensing, dual 8-by-8 time-of-flight grids, and 200 procedurally generated orchard trees.
- Reduced range RMSE from 6.08 mm to 5.49 mm with dual-sensor fusion on 651 shared synthetic samples; evaluated sensor-blackout regressions alongside the nominal result.

### Bimanual Garment Folding | SmolVLA, PyTorch, Isaac Sim

- Integrated a 450M-parameter vision-language-action policy with PhysX cloth, three camera views, and the LeHome folding checker; implemented an OpenUSD Storm observer for simulator rollouts.
- Fixed particle-to-mesh indexing behind invisible garments in 11 of 33 recorded episodes; added geometry checks and separated demonstration replay results from trained-policy evaluations.

## Experience

### Graduate Teaching Assistant, Oregon State University | Sep 2025 – Jun 2026

- Led 2-hour studio sessions for 25+ students in Operating Systems I (C++) and Computational Methods (COMSOL); supported debugging, concurrency, memory management, and numerical simulation.

### Math and Computer Science Tutor, Oregon State University | Nov 2022 – Jun 2025

- Tutored 50+ students in mathematics, programming, and computer science; adapted explanations and debugging guidance to individual learning needs.

## Education

**Oregon State University**, Corvallis, OR

Master of Science in Artificial Intelligence | Jun 2026

Bachelor of Science in Computer Science (Applied: Data Science); Mathematics Minor | Jun 2025

## Additional Experience

**Berkeley Humanoid Lite hardware build (in progress):** Soldered 22 magnetic encoders to motor controllers, 3D-printed structural parts, and began actuator calibration and limb assembly.