

# Jonathan Zamora

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## Education

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**University of Southern California**, M.S. Computer Science 2023 – 2026  
Coursework: Robot Learning, Robotic Perception, Robotics, Deep Learning, Machine Learning

**University of California San Diego**, B.S. Computer Science 2020 – 2023  
Coursework: Deep Learning, Deep Learning for 3D Data (Grad), Visual Learning (Grad), Computer Vision, CSE Honors Thesis

## Experience

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**UC Berkeley – Robot Learning Lab**, Visiting Researcher Sep 2025 – Present

- Developing visuotactile policy learning methods for contact-rich manipulation on a **YAM 6-DoF** arm.
- Evaluating generalization via sim-to-sim transfer between **MuJoCo Warp** and **NVIDIA PhysX** for rigid-body manipulation, and sim-to-real transfer in **NVIDIA Newton** for deformable and granular object manipulation.

**ACME Robotics (Stealth)**, Robotics Engineer • Contract Jan 2026 – Apr 2026

- Implemented **Real-Time Chunking** on a bimanual **SO-101** system, enabling high-precision tasks including USB insertion on real hardware.
- Built **mjlab** simulation environments for systematic policy diagnostics and regression testing before hardware deployment.
- Designed an agentic Python orchestration layer (Claude API) coordinating sim and real workflows with high-fidelity sim-to-real matching.

**USC – Physical Superintelligence Lab / SLURM Lab**, Graduate Researcher Aug 2023 – Dec 2025

- Designed and built **mjcompose**, a programmatic robot-composition framework for scalable single-arm and bimanual manipulation research.
- Built **RTMBench**, a MuJoCo benchmark of 16 tool-manipulation tasks on the **Franka Panda** with 14 pre-attached tools and **PPO / SAC / CrossQ** baselines; in-progress sim-to-real integration into mjlab.
- Built real-time vision-based teleoperation for the **Allegro** and **LEAP** dexterous hands using ArUco + **MediaPipe** hand tracking via iPhone Continuity Camera, with **mink** IK on real hardware.

**UC San Diego – Xiaolong Wang Lab**, Undergraduate Researcher Nov 2021 – Aug 2023

- Co-led **GraphIRL**, inverse RL using graph abstractions to learn task rewards from video; published at **CoRL 2022 (Oral, top 6.5%)**.
- Implemented XIRL, TCN, and LIFS baselines in **PyTorch**; evaluated with **SAC** on MuJoCo manipulation tasks and the **X-MAGICAL** cross-embodiment benchmark.

**USC – INK Lab**, Undergraduate Researcher Jun 2021 – Nov 2021

- Co-developed **Imagine-and-Verbalize**, a scene-graph-constrained generation method for CommonGen and visual storytelling (**ICLR 2022 Poster**); implemented T5, KG-BART, EKI-BART, KFCNet in **PyTorch / HuggingFace**.

**Earlier research (UCSD)**: Surgical video segmentation in ARCLab (**MICCAI 2021 HeiSuRF**, 4th/8); OCR feasibility classifier in Berg Lab; scRNA-seq tooling for GenePattern in Mesirov Lab; seizure prediction in SEELab.

## Projects

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### **mjcompose: Programmatic Robot Composition in MuJoCo**

Python framework that programmatically attaches arbitrary end-effectors to robot arms in MJCF; ships with rendering, viewing, and dataset-generation utilities; targets reproducible single-arm and bimanual manipulation experiments.

### **RTMBench: Robot Tool Manipulation Benchmark**

MuJoCo benchmark of 16 tool-manipulation tasks on the **Franka Panda** with 14 pre-attached tools, spanning 8 categories: pouring, scooping, scraping, hammering, stacking, and more. State- and vision-based observation spaces with **PPO**, **SAC**, and **CrossQ** baselines. In-progress sim-to-real extension into mjlab.

### **so101-mjlab: Sim-to-Real Manipulation on SO-101**

Personal **mjlab** project for sim-to-real transfer of pick-and-place primitives, including cube lifting, cube stacking, and light-weight-object pickup, on cost-effective SO-101 hardware.


### **Language-Conditioned Manipulation: USC NLP Coursework**

Speech-to-action pipeline that decomposes natural-language instructions into sequential pick-and-place and stacking actions in a custom MuJoCo simulator; supports live interactive demos.

## RUKA: Dexterous Hand in MuJoCo

CAD-to-MJCF pipeline (Onshape + onshape-to-robot + pymeshlab) for the 16-DoF RUKA dexterous hand, targeting in-hand cube rotation.





**awesome-robot-learning-envs** (★ 122)

 [jonzamora/awesome-robot-learning-envs](#)

Curated catalog of popular simulation environments and benchmarks for robot learning research.

## Open-Source Contributions

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-  **MuJoCo Menagerie**: added the **ARX L5** arm description; corrected **LEAP Hand** thumb range and appearance; adjusted **SO100** joint limits to match real hardware.
-  **robot\_descriptions.py**: added the **ARX L5** arm; updated MJCF paths for **Unitree G1** and **Piper**.
-  **mink**: fixed a numerical-stability issue in the SO(3) logarithm.
-  **mjlab**: fixed mesh-material handling in mujoco-to-trimesh conversion.

## Publications

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**Graph Inverse Reinforcement Learning from Diverse Videos.** Kumar, **Zamora\***, Hansen\*, Jangir, Wang.

*CoRL 2022*, **Oral (Top 6.5%)**. [arXiv](#) | [site](#)

Workshop presentations at NeurIPS 2022 Deep RL Workshop and CoRL 2022 Aligning Robot Representations Workshop.

**Contextualized Scene Imagination for Generative Commonsense Reasoning.** Wang, **Zamora\***, Liu\*, Ilievski, Chen, Ren.

*ICLR 2022*, Poster. [arXiv](#)

## Leadership & Teaching

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**ACM AI Board**, UC San Diego: Director of Marketing → President

Oct 2020 – May 2023

- Led AI workshops, projects, and competitions for **1300+** members; mentored cohorts on computer vision and deep RL; spearheaded an AI competition with a \$5K prize pool.

**Computer Science Tutor**, Grossmont Community College

Aug 2019 – Dec 2020; Aug 2023 – Jul 2025

- Assisted **400+** students across data structures (Java/C++), systems programming, Python, SQL, and discrete structures.

## Skills

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**Languages:** Python, C++, SQL, Bash, Java, MATLAB

**Robotics & Simulation:** MuJoCo, MuJoCo Warp, mjlab, MuJoCo Menagerie, Isaac Sim, Newton, PhysX, ROS2, URDF/MJCF, mink (IK), OpenAI Gym

**ML / DL:** PyTorch, JAX, NumPy, scikit-learn, OpenCV, HuggingFace Transformers

**Robotics Methods:** Imitation Learning, Reinforcement Learning, Sim2Real, Domain Randomization, Visuotactile Policy Learning, Dexterous Manipulation, Bimanual Manipulation

**Hardware:** SO-101 (bimanual), YAM, Franka Emika Panda, UR5e, xArm6/7, AgileX PiPER, Trossen WidowX; Intel RealSense

**Infra:** Docker, Kubernetes, SLURM, Git, Linux

**Spoken Languages:** Spanish (Native), English (Native)

**Honors:** McNair Scholar; CAMP STEM Scholar; Viterbi SURE Scholar; CSE ERSP Scholar; Google ExploreCSR Scholar