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SUMMARY

Deploy and debug learned manipulation policies on physical robots: 92% pick-and-place success over 50 scored SO-101 rollouts, with every failure traced through perception, policy, control, and motor-bus firmware. Build the real/sim data pipelines and training infrastructure behind it, from LeRobot data collection through PyTorch/CUDA policy training on ACT and SmolVLA (VLA) architectures to Isaac Sim/MuJoCo sim-to-real validation and resumable evaluation harnesses operators run unattended.

EXPERIENCE

Graduate Research Assistant

Mar. 2026 – Present

SJSU Applied Data Science Lab

San Jose, CA

- Deployed and scored an Action Chunking Transformer policy on a physical SO-101 arm: **92% task success** and **2.49 cm** mean placement error over 50 rollouts, scored against a protocol locked before evaluation began with a per-trial no-grasp / grasped-then-dropped / wrong-placement failure taxonomy.
- Debugged the full stack from perception to hardware: isolated 100% of failures to no-grasp perception rather than control, traced 11–51 s policy stalls to out-of-distribution objects in the camera view, and patched an STS3215 EEPROM re-lock defect that silently reverted motor IDs across power cycles and left the arm unusable.
- Trained and tuned 52M-parameter ACT and 99.9M-parameter SmolVLA (VLA) policies in PyTorch/CUDA over 60K- and 20K-step runs, benchmarking 18 ms against 251 ms inference latency for closed-loop feasibility and showing that validation-loss checkpoint selection would have shipped a 67% worse policy (2.01 vs 1.20 action MAE).
- Built the real/sim data collection and eval pipelines operators run: a LeRobot v3 dataset synchronizing 6-DoF joint states and actions with dual 640x480 RGB streams at 30 FPS, pre-training quality gates that cleared **49,633 frames with zero integrity failures**, and a resumable harness with automatic return-to-start, stale-cache guards, and video-measured placement error.

Software Engineer

Jun. 2023 – Jun. 2024

Sapaad

Dubai, UAE

- Shipped production Python ETL/ELT pipelines in Databricks and PySpark processing **5M+ rows per day** for tenant-facing analytics on a multi-tenant platform.
- Cut p95 dashboard query latency **43%** (12.4 s to 7.1 s) across 10+ Spark jobs serving 75+ tenant dashboards by profiling execution plans, rewriting SQL window functions, and placing targeted caches.
- Caught 14 schema, freshness, and ingestion anomalies automatically by building a Delta Lake data-quality framework with schema validation and freshness checks across every ingestion pipeline.

Computer Vision Engineer Intern

Sep. 2022 – Dec. 2022

Toothlens

Remote, India

- Built an unpaired image-to-image translation pipeline in PyTorch for orthodontic preview generation, removing the dependency on paired before/after patient captures that the clinic had no practical way to collect.
- Defined a cycle-reconstruction SSIM evaluation protocol that made candidate architectures comparable under partial occlusion, low light, and off-angle capture, the conditions that dominate real patient photos, turning model selection into a measured decision rather than a visual one.
- Selected CycleGAN over Pix2Pix and variational autoencoder baselines on that protocol and carried it through to a working preview prototype, documenting the comparison so the choice could be revisited as more data arrived.
- Increased usable patient-image inputs **20%** across 1,500+ real-world photos by implementing OpenCV preprocessing guardrails that screened and corrected degraded captures before they reached the model.

PROJECTS

Real2Sim2Real: Sim-to-Real Workspace Mirroring | Isaac Sim, MuJoCo, ROS 2, OpenCV Aug. 2026 – Present

- Mirrored a physical manipulation workspace into simulation by localizing task objects with ArUco markers from one calibrated overhead camera and reproducing their coordinates in an Isaac Sim scene, so policies train against the real table layout rather than a synthetic one.
- Validated control approaches for SO-ARM101 and Franka Emika Panda arms in Isaac Sim and MuJoCo before hardware execution, removing physical robot time from the iteration loop for failure cases that reproduce in simulation.
- Bound simulation and real coordinate frames through a single camera-calibration step, holding object poses consistent between the physics scene and the lab table across resets.

- Containerized ROS 2 Robotics Runtime** | *Docker Compose, ROS 2 Jazzy, Gazebo Harmonic, RViz* Mar. 2026
- Reduced robotics environment setup to **1 command** on macOS and Linux by packaging ROS 2 Jazzy, Gazebo Harmonic, RViz, and a TurtleBot3 model into a reproducible Docker Compose stack.
 - Eliminated X11 forwarding failures on GUI simulation tools by embedding a browser-accessible desktop in the container, so operators run identical tooling without host-specific configuration.
 - Pinned OS, ROS distribution, and simulator versions in the image so results transfer unchanged between developer laptops and lab workstations.
- Distributed Hiring Platform with Agent Workflow** | *FastAPI, Kafka, LangGraph, Redis, Docker* Spring 2026
- Shipped a **17-container** platform across 5 service groups, keeping resume parsing and embedding matching off the synchronous request path by routing them through Kafka topics with shared trace IDs.
 - Cut repeat profile-lookup latency **6x** under 100 concurrent threads with cache-aside Redis reads and write invalidation.
 - Benchmarked single-instance against multi-replica deployment at 500 concurrent threads to quantify the response-time and throughput tradeoff before selecting a topology.

TECHNICAL SKILLS

Robot Learning: PyTorch, CUDA, LeRobot, Action Chunking Transformer (ACT), SmolVLA, VLA policies, imitation learning, behavior cloning, teleoperation, policy training and evaluation, data curation, neural network debugging

Robotics & Simulation: SO-101 / SO-ARM101, Franka Emika Panda, ROS 2, NVIDIA Isaac Sim, MuJoCo, Gazebo, OpenCV, ArUco, camera calibration, sim-to-real, STS3215 servo bus

Languages: Python, SQL, TypeScript, Bash

Infrastructure & Tooling: Docker, Git, Linux, Weights & Biases, Hugging Face Hub, GitHub Actions, FastAPI, AWS EC2 GPU instances

Data Pipelines: PySpark, Databricks, Spark SQL, Delta Lake, Parquet, Kafka, Airflow

EDUCATION

San Jose State University

M.S. in Applied Data Science

Expected Dec. 2026

San Jose, CA

Illinois Institute of Technology

B.S. in Artificial Intelligence

May 2023

Chicago, IL