

# Dhruv Patel

Research Assistant – Robotics & Reinforcement Learning

San Jose, CA, United States | [LinkedIn](#) | [GitHub](#) | [Portfolio](#)

Robotics engineer building cross-embodiment learning systems and sim-to-real pipelines for humanoids, quadrupeds, and manipulators; expertise in teleoperation, VLA/RL evaluation, and hardware debugging.

## EXPERIENCE

**Research Assistant – Robotics & Reinforcement Learning** Jan 2026 — Present  
San José State University *San Jose, CA*

Built a training-to-robot loop for Unitree G1 humanoid, Go2 quadruped, and xArm7 that collects teleoperation and joint-state data, trains PPO/behavior-cloning policies in Isaac Lab, runs simulation gates, and deploys to hardware—cutting setup time from 90 to 30 minutes. Instrumented RGB-D, IMU, and joint-state logs with shared timestamps and offline replay to isolate DDS packet loss, frame calibration drift, and joint-limit violations, reducing debugging turnaround from 45 to 15 minutes.

**President | Applied Intelligence Systems (AIS) Club** Dec 2025 — Present  
Applied Intelligent Systems at SJSU

As President of the AIS Club, I drive initiatives that enhance member engagement and professional growth.

- Spearheaded the planning and execution of events and workshops tailored to member interests and industry trends.
- Fostered collaboration with faculty and alumni to provide networking opportunities and professional development resources.
- Developed strong communication strategies to gather feedback and streamline event planning processes.

**Senior Associate Software Engineer (AI/ML)** Apr 2024 — Jul 2025  
Bain & Company *New Delhi, Delhi, India*

Fine-tuned Mistral-8B and integrated RAG over Bain's presentation corpus for a slide-generation workflow, automating template selection and data population to deliver 40% productivity gain. Built distributed PySpark/Redshift pipelines processing 1 TB+ daily with schema validation, idempotent execution, and alerting—reducing pipeline rework by 60%. Deployed W&B experiment tracking and CloudWatch observability across 50+ experiments, cutting incident triage from 40 to 20 minutes.

**Research And Development Engineer** Jun 2022 — Apr 2024  
Samsung R&D Institute India *Noida, Uttar Pradesh, India*

Led R&D for an instruction-based image-editing system combining LLM instruction parsing with Stable Diffusion, optimizing inference by 250 ms for interactive use. Prototyped real-time English-to-Hindi translation and automated reply generation achieving 450 ms inference for bilingual voice interactions. Profiled and debugged a production LLM image-editing service, reducing p99 latency from 1.2 s to 480 ms through batching, async execution, and resource optimization. Deployed on-device ML models using quantization and knowledge distillation, reducing model size by 60% while preserving 98%+ accuracy.

**Software Engineer Intern** Jun 2021 — Jul 2021  
Wipro Limited *India*

**Data Analyst Intern** Jun 2020 — Aug 2020  
Edulyt India

**Research Intern** Dec 2019 — Feb 2020  
Sardar Vallabhbhai National Institute of Technology, Surat *Surat Area, India*

## EDUCATION

**San José State University** Aug 2025 — May 2027  
*Master of Science - MS in Applied Data Intelligence*  
GPA: 3.8/4.0

**Sardar Vallabhbhai National Institute of Technology, Surat** Jun 2018 — May 2022  
*Bachelor of Technology - BTech in Electronics and Communication Engineering*  
GPA: 3.7/4.0

## PROJECTS

**The Last Degree – Graduate ROI Intelligence**  
An end-to-end intelligence platform that bridges the gap between educational investment and job market reality. By unifying university data, live job listings, and layoff trends, the platform provides data-driven career insights via a modern web interface and an AI-powered SQL agent.

Technical Overview:

Backend & Data Engineering: Orchestrated complex ETL/ELT pipelines using Apache Airflow to ingest and unify

disparate university, Adzuna job market, and BLS datasets into Snowflake. Resolved data fragmentation by implementing fuzzy-joins and lookup tables for missing primary keys.

AI & Analytics: Architected an LLM-based SQL Agent to allow natural language querying of complex ROI datasets. Integrated an Apache Superset dashboard for enterprise-level visualization of layoff trends and market volatility.

Frontend & UI/UX: Developed a high-performance, responsive interface (<https://thelastdegree.dev/>) to visualize Graduate ROI ratios, active job distributions, and real-time WARN notice trends.

Key Achievement: Created a unified data model across 6,400+ institutions and 21k+ active job listings to calculate real-time career "Return on Investment."

### **End-to-end teleoperation capture from motion-capture gloves/suit to Unitree G1 humanoid with synchronized multimodal logging.,** Humanoid Teleoperation & Multimodal Robot Data Pipeline

Built a Rokoko-to-robot teleoperation pipeline streaming 60 Hz body/hand pose into ROS 2, retargeting motion to the Unitree G1 humanoid and BrainCo Revo2 hand. Collected 120 episodes with 30 Hz RGB video, 60 Hz human pose, robot joint state, and hand commands, maintaining timestamp alignment and dropped samples below 1%. Added one-click calibration, Wi-Fi/DDS health checks, and packet-age alerts to isolate connection faults without full-stack restarts.

### **VLM-grounded navigation for Unitree Go2 quadruped with semantic map persistence across episodes.,** Vision-Language Navigation & Persistent Semantic Memory

Built a Unitree Go2 vision-language navigation stack that parses natural-language commands, grounds objects in RGB-D observations, associates detections with map coordinates, and sends goals to Nav2—reaching correct landmarks in 50/60 scripted trials. Implemented persistent semantic memory storing object labels and embeddings; on revisits, retrieved previously seen targets 88% of the time versus 63% with only current observations. Classified failure modes and replayed them in Isaac Sim, tuning confidence thresholds and waypoint validation to raise success from 68% to 83%.

### **Residual-RL adaptation across humanoid, quadruped, and manipulator robots with domain randomization.,** Cross-Embodiment RL & Sim-to-Real Policy Evaluation

Explored COMPASS residual-RL adaptation in Isaac Lab for Unitree G1 humanoid and Go2 quadruped: kept base velocity policy frozen and trained PPO residual corrections for embodiment-specific dynamics, comparing goal success and collision rate over 100 episodes per checkpoint. Applied domain randomization across mass, friction, sensor noise, and command latency for manipulation policies, reducing sim-only failures and improving physical xArm7 transfer success from 62% to 78%.

## **CERTIFICATIONS**

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|---------------------------------------------------------------------------------------------------------|----------|
| <b>Mastering Model Context Protocol (MCP),</b> LinkedIn                                                 | Sep 2025 |
| <b>Lean Six Sigma for a Sustainable Future,</b> LinkedIn                                                | Aug 2023 |
| <b>Software Architecture Foundations,</b> LinkedIn                                                      | Aug 2022 |
| <b>Applied Data Science Capstone,</b> Coursera                                                          | May 2020 |
| <b>IBM Data Science Professional Certificate,</b> Coursera                                              | May 2020 |
| <b>Data Visualization with Python,</b> Coursera                                                         | May 2020 |
| <b>Structuring Machine Learning Projects,</b> Coursera                                                  | Apr 2020 |
| <b>Improving Deep Neural Networks: Hyperparameter tuning, Regularization and Optimization,</b> Coursera | Apr 2020 |
| <b>Machine Learning(Stanford Online),</b> Coursera                                                      | Apr 2020 |
| <b>Data Analysis with Python,</b> Coursera                                                              | Apr 2020 |
| <b>Programming Foundations with JavaScript, HTML and CSS (with Honors),</b> Coursera                    | Apr 2020 |
| <b>Databases and SQL for Data Science,</b> Coursera                                                     | Jan 2020 |
| <b>Machine Learning with Python,</b> Coursera                                                           | Jan 2020 |
| <b>Python for Data Science and AI,</b> Coursera                                                         | Dec 2019 |
| <b>Python for Data Science and AI,</b> Coursera                                                         | Dec 2019 |
| <b>Google Cloud Platform Fundamentals: Core Infrastructure,</b> Coursera                                | Dec 2019 |
| <b>Technical Support Fundamentals,</b> Coursera                                                         | Dec 2019 |
| <b>Neural Networks and Deep Learning,</b> Coursera                                                      | Dec 2019 |
| <b>Data Science Methodology,</b> Coursera                                                               | Dec 2019 |

## SKILLS

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Physical AI · SLAM · Motion Control · Visual SLAM · Robotics · Data Build Tool (DBT) · Airflow · Docker · React.js · Snowflake · Retrieval-Augmented Generation (RAG) · Systems Design · Natural Language Processing (NLP) · Computer Vision · Research and Development (R&D) · Large Language Models (LLM) · Distributed Systems · Generative AI · Generative Adversarial Networks (GANs) · Python · C++ · Java · SQL · JavaScript/TypeScript · ROS 2 · Nav2 · Unitree SDK2 · xArm7 · NVIDIA Isaac Lab · Isaac Sim · Sim-to-Real · ROS Bags · Reinforcement Learning · Behavior Cloning · Imitation Learning · Vision-Language-Action (VLA) · Teleoperation · Motion Retargeting · RGB/RGB-D Cameras · Depth Sensors · LiDAR · IMU · Camera Calibration · OpenCV · PyTorch · CUDA · TensorRT · NVIDIA Jetson · Quantization · W&B · Structured Logging · CI/CD · Linux · ROS 2/DDS Diagnostics · Model Fine-Tuning · Dataset Curation · Multimodal Data Pipelines · Benchmarking