

ALFRED CUEVA

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EDUCATION

Georgia Institute of Technology

Aug. 2025 – May 2027*MS in Robotics* | **GPA: 4.0/4.0***Georgia, United States*

- Coursework: Deep Reinforcement Learning, Computer Vision, Advanced Mobile Robotics, Deep Learning

Seoul National University

Mar. 2020 – Feb. 2024*BS in Mechanical Engineering (Robotics Concentration)* | **GPA: 9.12/10.0***Seoul, South Korea*

- Coursework: Reinforcement Learning, Advanced Programming, Autonomous Navigation, Machine Learning, Linear Control

Publications

Diffusion Policy Fine-Tuning for Humanoid Loco-Manipulation via Reinforcement Learning

Zhaoyuan Gu*, Yipu Chen*, Zimeng Chai*, **Alfred Cueva**, Thong Nguyen, Huishu Xue, Yifan Wu, Amelie Minji Kim, Isaac Legene, Yongxin Chen, Ye Zhao

arxiv preprint [[Paper](#)]

WORK EXPERIENCE

Samsung | Robotics & ML Software Engineer

Mar. 2024 – Aug. 2025

- Deployed production YOLOv8 perception system for collaborative robots, achieving 92% detection accuracy through dataset creation (10K+ images), model training, on-device optimization, and CI/CD pipeline integration. [[Coverage](#)]
- Spearheaded development of precision control and SLAM-based localization for a collaborative robot. Reduced positioning error by 15% and earned a \$10,000 award in the [[Smart Construction Challenge](#)] from the Korean Government.
- Developed ROS2 based autonomous navigation stack for KUKA platforms combining RRT* and Hybrid A* planning with real-time perception, enabling decision-making under uncertainty in dynamic, cluttered environments.
- Built Isaac Sim workflows generating synthetic training data with domain randomization and sensor simulation. Lead cross-team integration of simulation pipeline to validate sim-to-real transfer of manipulation/navigation/control modules.

Samsung | Computer Vision Intern

Jul. 2023 – Aug. 2023

- Developed a heat anomaly detection system for semiconductor equipment, designing model architecture and GPU pipelines to efficiently process large-scale sensor data for real-time decision making.
- Integrated perception and collision-aware planning for autonomous cluttered-bin retrieval, deploying and optimizing SAM on industrial hardware for improved inference performance.

RESEARCH EXPERIENCE

Georgia Institute of Technology | LIDAR Lab | Research Assistant

Aug. 2025 – Present

- Designed hierarchical control framework combining diffusion policies with Reinforcement Learning (RL) controller fine-tuning, to improve task success rates for complex humanoid loco-manipulation tasks. (*Submitted to RA-L/IROS*)
- Led development of Docker cloud infrastructure and custom Isaac Lab environments for mobile robot, defining task specifications, physics models, reward functions, and observation/action spaces for complex manipulation tasks.
- Developed USD-based simulation workflows with body dynamics and articulation controllers to achieve high fidelity sim-to-real transfer; validated whole body stabilization and fine manipulation policies through hardware experiments.

PROJECTS

Diffusion Policy for Long Horizon Manipulation | [[GitHub](#)] | [[Report](#)]

Fall 2025

- Implemented transformer-based diffusion policies for long-horizon manipulation tasks including multi-step pick-and-place and block assembly, achieving 85% success rate on step sequential tasks with 200+ teleoperated expert demonstrations.
- Integrated camera-calibrated ArUco-based 6DoF pose estimation with action diffusion for closed-loop execution on UR10e robot, enabling real-time visual servoing and adaptive replanning under uncertainty.

Multi-Modal Perception for Autonomous Maze Navigation | [[GitHub](#)]

Fall 2025

- Designed end-to-end ROS2 autonomous navigation stack integrating LiDAR-based Bug0 obstacle avoidance with vision-based traffic sign recognition using KNN classifier, coordinated through hierarchical state machine architecture.
- Deployed on TurtleBot3 platform for autonomous maze navigation with real-time sign detection and adaptive waypoint generation, validated in both Gazebo simulation and real-world deployment.

SKILLS

Programming Languages and Tools: Python, C++, MATLAB, Julia, Docker, Git, CI/CD

Machine Learning Tools: PyTorch, Numpy, Pandas, Scikit Learn, Matplotlib, CV2

Robotics: ROS2, Linux, Gazebo, RViz, Isaac Sim/Lab, PyBullet, MuJoCo, Solidworks, Fusion 360, Ansys