

# 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, Vision-Language Models, Advanced Mobile Robotics

### 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, Deep Learning, Linear Control

## SKILLS

**Languages and Tools:** Python, C++, MATLAB, Julia, Docker, Git, Drake

**ML & Perception:** PyTorch, YOLO, Vision-Language Models, Diffusion Models, Model Optimization

**Robotics:** ROS2, Gazebo, Isaac Gym/Sim/Lab, PyBullet, MuJoCo, RViz, Multi-Sensor Fusion

**Core Expertise:** Reinforcement Learning, Autonomous Navigation, Real-Time Perception, System Integration

## WORK EXPERIENCE

### Samsung

Mar. 2024 – Aug. 2025

Robotics & ML Software Engineer

Seoul, South Korea

- Led the deployment of a production **YOLOv5** perception system, achieving **92%** detection accuracy for mobile robots. Oversaw the full ML lifecycle, including dataset curation (10K+ labeled images), model development, and real-time on-device inference. [\[Coverage\]](#)
- Directed the development of an autonomous navigation stack for **KUKA** platforms using **RRT\*** and **Hybrid A\*** path planning with real-time obstacle avoidance, enabling safe operation in dynamic, cluttered environments.
- Implemented state-of-the-art models such as **DINO** and **NeRF** for high-fidelity image reconstruction, improving 3D scene understanding and sensor perception pipelines.
- Spearheaded precision control and **SLAM**-based localization software for a 7-DOF manipulator, reducing positioning error by **15%**; recognized with **\$10,000** award in [\[Smart Construction Challenge\]](#).
- Optimized large-scale **Isaac Sim** workflows by profiling GPU workloads to boost RL training throughput; built USD digital twins for synthetic data and policy validation. Collaborated with software, perception, and mechanical teams to validate policies on robots.

### Samsung

Jul. 2023 – Aug. 2023

Engineering Intern

Seoul, South Korea

- Built thermal anomaly detection system using CNNs for semiconductor facilities, achieving 40% efficiency gain through optimized architecture design and GPU acceleration.
- Implemented real-time human tracking with PixyCam for AGV collision avoidance in safety-critical environments.
- Benchmarked Isaac Sim/Mujoco for robotics simulation, optimizing GPU compute workloads for real-time control loops.

## RESEARCH EXPERIENCE

### Georgia Institute of Technology | LIDAR Lab | Prof. Ye Zhao

Aug. 2025 – Present

- Lead development of long horizon policies for humanoid loco-manipulation using diffusion and Reinforcement Learning on large-scale robot interaction datasets with real-time inference constraints. *Under review for RA-L/IROS.*
- Developing vision-based motion planning combining generative diffusion with constrained optimization for safe manipulation in complex environments. Oversaw VR integration for teleoperation using Quest headsets.

### Seoul National University | DYROS Lab | Prof. Jaeheung Park

Dec. 2022 – Feb. 2024

- Designed model-free RL + Bayesian Optimization framework for bipedal robot co-design, achieving 19% speed improvement and 22% energy cost reduction in sim-to-real transfer. *Outstanding Thesis Award (1/120).* [\[Paper\]](#)

## PROJECTS

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

Aug. 2025 – Dec. 2025

- Implemented transformer-based diffusion policies for multi-step pick-and-place and block assembly tasks; integrated ArUco-based 6-DoF state estimation and closed-loop action diffusion on a UR10e platform for robust long-horizon execution.

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

Aug. 2025 – Dec. 2025

- Built end-to-end autonomous navigation system fusing camera-based sign classification with LiDAR wall detection for real-time path planning. Implemented full ROS2 perception-planning-control pipeline achieving reliable long-horizon navigation.

### Autonomous Racing with Vision-Based Control | [\[GitHub\]](#)

Aug. 2023 – Nov. 2023

- Developed imitation learning pipeline from expert demonstrations, training vision-based policies for high-speed racing. Deployed on physical RC car with camera/LiDAR fusion for real-time perception and control at 30Hz.