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

WORK EXPERIENCE

Samsung | Robotics & ML Software Engineer   **Mar. 2024 – Aug. 2025**

- Deployed production YOLOv8 perception system for mobile robots, achieving 92% detection accuracy through dataset creation (10K+ images), model training in PyTorch, on-device optimization, and CI/CD pipeline integration. [Coverage]

- Spearheaded development of precision control and SLAM-based localization for a 7-DOF manipulator; 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.

- Engineered sensor fusion collision avoidance for AGVs by combining IMU and other perception data to achieve fast, reliable navigation in dynamic industrial settings.

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)*

- Built VR teleop pipeline for human demonstration collection, enabling real-time trajectory recording, automated dataset generation, and streamlined content pipelines for imitation/reinforcement learning.

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.

Autonomous RC Car Racing | [GitHub]   **Fall 2023**

- Developed autonomous RC car racing system using LiDAR-only perception for mapless navigation, implementing behavior cloning with Gaussian Process Regression to learn driving policy from expert demonstrations.

- Trained end-to-end control policy mapping raw sensor observations directly to steering and throttle commands, achieving collision-free racing performance and competitive lap times in inter-university competition.

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