Alfred Cueva

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Education

Seoul National University **Mar. 2020 – Feb. 2024**

BS in Mechanical Engineering (Robotics Concentration) *Seoul, South Korea*

- Coursework: Reinforcement Learning (Graduate), Humanoid Robot Bipedal Walking and Control (Graduate), Sensor-Based Spatial Intelligence (Graduate), Introduction to Robotics, Mechanical System Modeling and Control

Professional Experience

Samsung C&T **Mar. 2024 – Present**

Robotics Engineer *Seoul, South Korea*

- Developed obstacle detection system using YOLOv5 for collaborative robots with 92% accuracy
- Engineered control software using Disturbance Observer, reducing steady-state error by 15% and enhancing precision of a 7-DOF manipulator.
- Implemented RRT-based motion planning for drill manipulator arms operating on cluttered environments.
- Designed human-machine interface for robotic operation, integrating ROS with visualization tools (Rviz and Gazebo).

Research Experience

Dynamic Robotics Systems Lab **Sep. 2023 – Feb. 2024**

Undergraduate Thesis Research Intern - PI: Prof. Jaeheung Park *Seoul, South Korea*

- Developed a Deep Reinforcement Learning framework to find optimal actuator designs for legged robots with weak actuation using PPO, Potential Based Rewards and Bayesian Optimization.
- Achieved a 19% improvement of the maximum forward velocity under curriculum learning and increased velocity tracking accuracy. Reduced cost of transportation by 22% while ensuring a symmetric gait for added mass scenarios.
- Awarded **Outstanding BS Thesis Presentation Award**

Samsung C&T **Jul. 2023 – Aug. 2023**

Research Intern - Supervisor: Ph.D. Jun-ho Hyun *Seoul, South Korea*

- Engineered a deep learning algorithm for detecting heat anomalies in semiconductor sites, improving positional accuracy and heat map estimation efficiency by 40%.

Dynamic Robotics Systems Lab **Dec. 2022 - Jul. 2023**

Research Intern - PI: Prof. Jaeheung Park *Seoul, South Korea*

- Designed novel reward functions for model-free reinforcement learning algorithms (PPO) and evaluated their impact on bipedal locomotion tasks, leading to significant performance enhancements in IsaacGym simulator trials.
- Optimized learning pipeline with parallel environments and hyper-parameter tuning, reducing convergence time.

Beam Studio **Jun. 2022 – Aug. 2022**

Research Intern - PI: Young-Beom Jeong *Seoul, South Korea*

- Created StyleGAN-based model for real-time video editing of time-series data using pixel2style2pixel encoders with pre-processing segmentation. The model overcomes the 'Uncanny Valley' problem at less than 1/20 of the cost of other methods.

Soft Robotics & Bionics Lab **Dec. 2021 – Mar. 2022**

Research Intern - PI: Prof. Yong-Lae Park *Seoul, South Korea*

- Designed a Capacitive Touch Sensing Grid as a force control interface for an Industrial Sewing Robot. Modeled force dynamics using Arduino and CoppeliaSim, improved sewing speed by 20%

Scholarships

- Global Korea Scholarship - Full ride for undergraduate studies (1 out of 300) **Mar. 2019 – Mar. 2024**
- COAR Scholarship - Full ride for IB Diploma Programme (0.2%) **Mar. 2016 – Feb. 2019**

Awards & Honors

- Smart Construction Robotics Challenge: Awarded 10k USD for novel drilling robot for semiconductor sites **Sep. 2024**
- Outstanding BS Thesis Presentation Award (1 out of 120) **Dec. 2023**
- Samsung C&T Corporation Global Intern (1 of 40 recipients nationwide) **Jul. 2023**
- Student Researcher Fellowship: Awarded 1k USD funding for undergraduate research **Jan. 2023**
- Certificate of Appreciation (OUTTA): Conferred by the Dean of College of Engineering **Jul. 2021**

Teaching Experience

Seoul National University **Mar. 2021 – Jul. 2021**

Instructor *Seoul, South Korea*

- Taught programming (Python) to underprivileged high school students as member of AI Tech Play Program.
- Conducted Workshop with a Hands-on Session for 30+ students on ROS and Gazebo
- Prepared problem sets on robotics foundations including linear algebra, kinematics and linear control

Extracurricular Activities

Peruvian Korean Academic Association (ASAPEC) **Mar. 2023 – Dec. 2023**

- Lead a team of 20 members to organize fraternity meetings and informative sessions for prospective students in STEM fields and those interested in higher education in Korea.

Sigma Intelligence Group **Mar. 2020 - Mar. 2021**

- Reviewer for Creative Engineering Fair, evaluating projects on LIDAR, PLC control, and PID-based path planning techniques.

OUTTA **Mar. 2021 - Aug. 2021**

- Organizer of "The First Autonomous Driving Mini Car Coding and Contest"

Skills

- Languages: Python, C++, C, MATLAB, Julia
- Frameworks: Pytorch, Numpy, Scikit Learn, ROS, YOLO, MuJoCo, CoppeliaSim, IsaacGym, IsaacSim, PyBullet
- Optimization: Gurobi, Eigen, PuLP, GLPK