Seoyeon Choi

Berkeley, CA | seoyeon99@berkeley.edu | Website | Linkedin

Education

Ph.D. in Mechanical Engineering, University of California, Berkeley — Aug 2024 - Present

- Advisor: Prof. Negar Mehr | Research Area: Robotics, Control and AI

B.S. in Mechanical Engineering, Yonsei University — Mar 2019 - Aug 2023

- GPA: 3.95/4.0, *Summa Cum Laude*
- Senior Thesis: Reinforcement learning for force control of robot manipulator in contact-rich tasks

Research Interest

Robot Learning, LLMs and VLMs for Robotics, Humanoid, Multi-agent systems, Reinforcement Learning

Selected Publications and Conference

See full list: Google Scholar — *equal contribution

- **S. Choi***, K. Ryu*, J. Ock, and N. Mehr, "CRAFT: Coaching Reinforcement Learning Autonomously using Foundation Models for Multi-Robot Coordination Tasks", submitted to **2026 IEEE International Conference on Robotics and Automation (ICRA)** (Link)
- D. Dong*, M. Bhatt*, **S. Choi**, and N. Mehr, "MIMIC-D: Multi-modal Imitation for MultI-agent Coordination with Decentralized Diffusion Policies", submitted to **2026 IEEE International Conference on Robotics and Automation (ICRA)** (Link)
- J. Seo, A. Kruthiventy, S. Lee, M. Teng, X. Zhang, **S. Choi**, J. Choi, and R. Horowitz, "EquiContact: A Hierarchical SE (3) Vision-to-Force Equivariant Policy for Spatially Generalizable Contact-rich Tasks." submitted to **IEEE Robotics and Automation Letters (RA-L)** (Link)

Research Experience

Intelligent Control (ICON) Lab, University of California, Berkeley — Aug 2024 - Present

Graduate Assistant, *Advisor*: Prof. Negar Mehr

Learning a Humanoid Whole-body Controller

- Developing a humanoid whole-body loco-manipulation controller via reinforcement learning, using VLMs to guide reward design.
- Leveraging the human-like reasoning ability of VLMs to enable training without any human motion datasets, unlike prior approaches that rely heavily on human demonstrations to shape whole-body behavior.

Learning Multi-robot Coordination using Foundation Models

- Proposed *CRAFT*, a curriculum-learning framework in which foundation models (LLMs/VLMs) act as coaches for multi-robot coordination tasks.
- Designed a closed-loop pipeline where foundation models generate curricula, refine rewards, and evaluate rollouts to improve policy learning.

Multi-agent Imitation Learning using Diffusion Policies

- Proposed *MIMIC-D*, a decentralized multi-agent imitation learning framework that captures multimodality in expert demonstrations using diffusion policies.
- Demonstrated MIMIC-D on decentralized bimanipulation task, using only local observations for each agent.

Machine Learning and Control Systems (MLCS) Lab, Yonsei University Jan 2022 - Jul 2024

Undergraduate Intern, *Advisor*: Prof. Jongeun Choi

- Developed a visuomotor policy for contact-rich task that learns end-effector forces and gains of admittance impedance controller using reinforcement learning

Project Experience

Development of Driver Models utilizing Reinforcement Learning, Hyundai Mobis Aug 2023 - Feb 2024

- Developed a reinforcement learning algorithm to optimize parameterized cost function scheduling in model predictive control for rear-wheel-steer model-in-loop simulation evaluation system.

ResQ4U: Unmanned Life-saving Rescue Launcher Robot, Yonsei University Mar 2023 - Jun 2023

- Created and designed a rescue robot that detects and launches a life jacket at a drowning person.
- Developed a mechanism to detect the person with an object detection machine learning model using an IR-RGB camera and a one-point LiDAR, and designed the actuators of pitching and aiming mechanism.

2022 Autonomous Driving Robot Racing Contest, Korea Robotics Society Jan 2022 - Nov 2022

- Developed a control algorithm utilizing LiDAR, IMU, and GPS for collision avoidance with other vehicles.
- Implemented Dijkstra and Regulated Pure Pursuit for planning and extended Kalman filter for localization.

Skills

Programming:	C/C++, Python, MATLAB/Simulink
Software & Tools:	PyTorch, JAX, TensorFlow, Mujoco, IsaacGym, ROS, Unity, CAD, 3D Printing
Hardware:	Jetson, Raspberry Pi, Arduino, Motion Capture (OptiTrack, Vicon)
Robots:	Humanoid (Unitree G1), Manipulator (Panda, Kinova, xArm), Quadruped (Unitree Go1, Go2), Turtlebot3, Scout Mini

Selected Honors, Awards and Services

Honors

Summa Cum Laude (Top 1% in College of Engineering), Yonsei University Aug 2023

Scholarships

National Science and Technology Scholarship, National Research Foundation of Korea Mar 2021 - Aug 2023

Yonsei Eminence Scholarship, Yonsei University Sep 2019 - Feb 2021

Reviewer

IEEE Robotics and Automation Letters (RA-L) 2025

IEEE International Conference on Robotics and Automation (ICRA) 2025

Extracurricular Activities and Leadership

YAI, Artificial Intelligence Club, Yonsei University Mar 2022 - Feb 2024

- Executive Staff (2023 - 2024), Projects: implementation of Diffusion Policy on custom task, car class video detection model, PyTorch implementations of RL algorithms

RoboIn, Robotics Club, Yonsei University Sep 2020 - Aug 2023

- President (2022), Vice President (2021), Executive Staff (2021 - 2023), Projects: quadruped, 4DOF robotic arm, quadrotor drone, mobile manipulator