Minseo Kwon

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Research Interests

Robotics, Task and Motion Planning, Robot Learning

Education

Ewha Womans University, Seoul, Korea

M.S., Artificial Intelligence and Software (Computer Science and Engineering) *Sept 2024 – Aug 2026*

- Advisor: Dr. Young. J. Kim
- Current GPA: 4.3/4.3

B.S., Computer Science and Engineering & Mathematics *Mar 2020 – Aug 2024*

- Graduated with Honors: Magna Cum Laude (GPA: 3.82/4.3)

Publications

Conference Papers

[C03] **M. Kwon** and Y. J. Kim, **Kinodynamic Task and Motion Planning using VLM-guided and Interleaved Sampling**, *IEEE International Conference on Robotics and Automation (ICRA)*, 2026, Under Reivew.

[C02] **M. Kwon**, Y. Kim, and Y. J. Kim, **Fast and Accurate Task Planning using Neuro-Symbolic Language Models and Multi-level Goal Decomposition**, *IEEE International Conference on Robotics and Automation (ICRA)*, 2025

[C01] S. Kwon*, **M. Kwon***, H. Kim* and J. Sim, **ToMato: Accelerating ViT via Token Merging**, *The Institute of Electronics and Information Engineers Conference*, 2023. (* Equal Contribution)

Journal Papers

[J02] Many Authors, **A Dataset and Benchmark for Robotic Cloth Unfolding Grasp Selection: The ICRA 2024 Cloth Competition**, *The International Journal of Robotics Research*, 2025, Under Review.

[J01] **M. Kwon**, and Y. Kim, **Neuro-Symbolic Task Replanning using Large Language Models**, *The Journal of Korea Robotics Society*, 2025.

Research Experience

Ewha Womans University, Seoul, Korea

Computer Graphics Lab, **Research Assistant** (Advisor: Dr. Young. J. Kim) *Sept 2024 – Present*

- **Task and Motion Planning:** Developed a kinodynamic task and motion planning framework that interleaves symbolic planning with motion validation, leveraging a VLM for guided exploration and strategic backtracking, and using physics simulation to enforce physical constraints. [C03]
- **WBCD Challenge:** Ranked 4th place in the Table Service Operations track in ICRA 2025 WBCD Challenge by teleoperating a robot to perform cloth folding, food container opening, and item arrangement tasks. [C04]

Computer Graphics Lab, **Undergraduate Researcher** (Advisor: Dr. Young. J. Kim) *Dec 2022 – Aug 2024*

- **Task Planning:** Developed a neuro-symbolic task planner for large-scale robotic tasks, reducing planning time and improving accuracy in various PDDL domains by generating subgoals with multimodal LLM. [C02] [J01]
- **Cloth Manipulation:** Developed a robotic cloth unfolding pipeline leveraging a point cloud–based edge detection method for grasp localization, winning 3rd place at the ICRA 2024 Cloth Competition. [H03] [J02]

Capstone Design Project (Advisor: Dr. Jaehyeong Sim) *Jan 2023 – Dec 2023*

- **Model Compression**: Accomplished a 22.19% reduction in inference latency for Vision Transformer-based models by recursively merging tokens at the early transformer block while preserving over 80% accuracy. [H01, H02] [C01]

Teaching Experience

Altu-Bitu, Algorithm Tutoring Program, *Ewha* *Fall 2022*

- Conducted lectures on data structures and computer algorithms for 40+ undergraduate students and provided feedback on assignment codes.

Honors & Awards

[H04] **4th Place** | What Bimanual Teleoperation and Learning from Demonstration Can Do (WBCD), ICRA, 2025

[H03] **3rd Place** | Robotic Grasping of Manipulation Competition (Cloth Manipulation Track), ICRA, 2024

[H02] **Silver Prize** | Ewha Engineering Capstone Design Contest, 2023

[H01] **3rd Place** | Undergraduate Research Paper Contest, Autumn Annual Conference of IEIE, 2023

Scholarships & Academic Awards

[S04] **Research Assistant Scholarship** | Ewha, 2025

[S03] **Graduate Admissions Scholarship (full tuition for 1 year)** | Ewha, 2024 - 2025

[S02] **Dean's List (7 semesters)** | Ewha, Fall 2020 - Spring 2024

[S01] **Undergraduate Admissions Scholarship (full tuition for 4 years)** | Ewha, 2020 - 2023

- Top-ranked entrant among all science and engineering applicants; received full tuition scholarship.

Skills

Programming Languages/Libraries: C++, C, Java, Python, Matlab, PyTorch, TensorFlow

Robot SW: ROS, OMPL, MoveIt!, Genesis, CoppeliaSim, Mujoco, Gazebo, Rviz

Robot HW: UR5e, Robotiq 3F adaptive gripper

Languages: Korean (Native), English (Advanced)

Other Activities

EDOC (Ewha Do Coding), Club President *Jan 2022 - Dec 2022*

- Led the on-campus algorithm club as president, organizing study sessions, inter-club collaborations, and programming competitions.