Hyunseo Kim

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RESEARCH INTERESTS

Robotics / Computer Vision / 3D generation / Imitation Learning / Reinforcement Learning

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EDUCATION

Ph.D. Interdisciplinary Program in Neuroscience 2019 – Present
Advised by Byoung-Tak Zhang
Seoul National University

BSc Biological Science (Minor in Computer Science) 2015 - 2019
Seoul National University

SELECTED PUBLICATION

1. **AffoRo-GS: Few-shot 3D Affordance Learning for Open-vocabulary Robotic Manipulation with Gaussian Splatting**
   <u>Hyunseo Kim</u>, Yeon-Ji Song, Minsu Lee, Byoung-Tak Zhang
   Under review at IEEE Robotics and Automation Letters**.**

2. **Active Neural 3D Reconstruction with Colorized Surface Voxel-based View Selection**
   <u>Hyunseo Kim</u>, Hyeonseo Yang, Taekyung Kim, YoonSung Kim, Jin-Hwa Kim, Byoung-Tak Zhang
   Arkiv, 2024.

3. **Learning Object Motion and Appearance Dynamics with Object-Centric Representations**
   Yeon-Ji Song, <u>Hyunseo Kim</u>, Suhyung Choi, Jin-Hwa Kim, Byoung-Tak Zhang
   Causal Representation Learning Workshop at Neural Information Processing Systems (NeurIPS), 2023.

4. **EXOT: Exit-aware Object Tracker for Safe Robotic Manipulation of Moving Object**
   <u>Hyunseo Kim</u>, Hye Jung Yoon, Minji Kim, Dong-Sig Han, Byoung-Tak Zhang
   International Conference on Robotics and Automation (ICRA), 2023.

5. **Robust Imitation via Mirror Descent Inverse Reinforcement Learning**
   Dong-Sig Han, <u>Hyunseo Kim</u>, Hyundo Lee, JeHwan Ryu, Byoung-Tak Zhang
   Neural Information Processing Systems (NeurIPS), 2022.

6. **Message passing adaptive resonance theory for online active semi-supervised learning**
   Taehyeong Kim, Injune Hwang, Hyundo Lee, <u>Hyunseo Kim</u>, Won-Seok Choi, Joseph J Lim, Byoung-Tak Zhang
   International Conference on Machine Learning (ICML), 2021.

7. **Label Propagation Adaptive Resonance Theory for Semi-supervised Continuous Learning**
   Taehyeong Kim, Injune Hwang, Gi-Cheon Kang, Won-Seok Choi, <u>Hyunseo Kim</u>, Byoung-Tak Zhang
   IEEE International Conference on Acoustics, Speech and Signal Processing (ICASSP), 2020.

* : equal contribution

RESEARCH PROJECTS

BabyMind Project (2019-2022)

- Developed online, self-supervised, continual feature learning methods for robots interacting with the real world in infant-like developmental settings.

SPARC Project (2024 – present)

- Developed agents capable of solving real-life manipulation tasks by 3D object recognition and learning affordance information from limited data.

TANK Project (2023- present)

- Implemented multi-agent deep reinforcement learning for AI crew in virtual combat simulations (SMAC and custom environments).

TEACHING EXPERIENCE

Artificial Neural Networks – Graduate Student Instructor	Fall 2022
Computational Neuroscience – Graduate Student Instructor	Fall 2022
Artificial Intelligence – Graduate Student Instructor	Spring 2023

WORKING EXPERIENCE

Part time Research Enginner – C51 (2023.08-2025.05)

- Developed a predictive maintenance system for shipboard equipment using sensor data analysis and statistical machine learning.

- Automated building crack inspection by deploying TurtleBot4 robots to patrol and scan QR codes for safety monitoring in a national collaborative project.

- Built a UR5e-based robotic system with a pneumatic gripper for cylinder handling, integrating YOLOv8 recognition and Raspberry Pi5-controlled actuation.

ACADEMIC SERVICE

Reviewer @ ICML, AAAI, CVPR, ECCV, ICCV, ICLR & NeurIPS	2022 - present

HONORS/ AWARDS

Robocup@Home 2022 (Team Tidyboy)
- Second Place in Domestic Standard Platform League (Team Tidyboy)
- First Place in Fastest Manipulation (Team Tidyboy)
- First Place in Robo-valet (Housekeeper highest score in Stage 1 tasks)
- First Place in Soul of the Party (Party-Host highest score in Stage 2 tasks)