

# SEUNGYEON KIM

Seoul, South Korea

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<https://seungyeon-k.github.io>

## RESEARCH INTERESTS

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- **Inductive bias for 3D recognition.** Developing recognition systems that incorporate inductive bias to reconstruct complete 3D object shapes from partial visual observations for robust and effective robotic manipulation.
- **Equivariant models for generalizable skill learning.** Leveraging equivariant architectures to improve data efficiency and generalization in various robot manipulation tasks, including dynamics learning and skill transfer.
- **Low-dimensional representations for adaptive robot agent.** Discovering compact trajectory representations to simplify high-dimensional control problems and enable fast adaptation to environmental changes.

## EDUCATION

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<b>Seoul National University</b> <i>Ph. D. in Mechanical Engineering</i> Advisor: Frank C. Park Thesis: <a href="#">Learning for Vision-Based Object Manipulation: A Shape Recognition-Based Approach</a> Honors: <i>Outstanding Doctoral Dissertation Award</i>	<i>Sep 2019 - Feb 2024</i> <i>GPA: 4.15 / 4.3</i>
<b>Seoul National University</b> <i>M. S. in Mechanical Engineering</i> Advisor: Frank C. Park / work closely with Sang-Hoon Yeo Thesis: On the Encoding Capacity of Human Motor Adaptation	<i>Mar 2017 - Feb 2019</i> <i>GPA: 4.22 / 4.3</i>
<b>Seoul National University</b> <i>B. S. in Mechanical Engineering, Minor in Economics</i> Honors: <i>Summa Cum Laude</i>	<i>Mar 2013 - Feb 2017</i> <i>GPA: 3.91 / 4.3 (Major 4.02 / 4.3)</i>
<b>Gyeonggibuk Science High School</b> One-year early graduation	<i>Mar 2011 - Feb 2013</i>

## RESEARCH EXPERIENCE

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<b>GeoRob Lab, KTH Royal Institute of Technology</b> Postdoctoral Researcher ( <i>Advisor: Noémie Jaquier</i> )	<i>Oct 2025 - Present</i>
<b>Robotics Laboratory, Seoul National University</b> BK21 Postdoctoral Research Fellow ( <i>Advisor: Frank C. Park</i> )	<i>May 2024 - Sep 2025</i>
<b>Institute of Advanced Machines and Design (IAMD)</b> Researcher in Intelligent Machine System Research Department	<i>Sep 2021 - Apr 2024</i>
<b>Institute of Advanced Machines and Design (IAMD)</b> Assistant Researcher in Intelligent Machine System Research Department	<i>Apr 2019 - Aug 2019</i>

## PUBLICATIONS

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- [C6] ScrewSplat: An End-to-End Method for Articulated Object Recognition  
Seungyeon Kim, Junsu Ha, Young Hun Kim, Yonghyeon Lee, Frank C. Park  
Conference on Robot Learning (CoRL), **Oral presentation (42/738 = 5.7%)**, 2025

- [P1] DreamGrasp: Zero-Shot 3D Multi-Object Reconstruction from Partial-View Images for Robotic Manipulation  
Young Hun Kim, **Seungyeon Kim**, Yonghyeon Lee, Frank C. Park  
arXiv, 2025
- [J4] Motion Manifold Flow Primitives for Task-Conditioned Trajectory Generation under Complex Task-Motion Dependencies  
Yonghyeon Lee, Byeongho Lee, **Seungyeon Kim**, Frank C. Park  
IEEE Robotics and Automation Letters (RA-L), 2025
- [J3] Diverse Policy Learning via Random Obstacle Deployment for Zero-Shot Adaptation  
Seokjin Choi\*, Yonghyeon Lee\*, **Seungyeon Kim**, Che-Sang Park, Himchan Hwang, Frank C. Park  
IEEE Robotics and Automation Letters (RA-L), 2025
- [C5] T<sup>2</sup>SQNet: A Recognition Model for Manipulating Partially Observed Transparent Tableware Objects  
Young Hun Kim\*, **Seungyeon Kim**\*, Yonghyeon Lee, Frank C. Park  
Conference on Robot Learning (CoRL), 2024
- [C4] Leveraging 3D Reconstruction for Mechanical Search on Cluttered Shelves  
**Seungyeon Kim**\*, Young Hun Kim\*, Yonghyeon Lee, Frank C. Park  
Conference on Robot Learning (CoRL), 2023
- [C3] Equivariant Motion Manifold Primitives  
Byeongho Lee\*, Yonghyeon Lee\*, **Seungyeon Kim**, MinJun Son, Frank C. Park  
Conference on Robot Learning (CoRL), 2023
- [C2] SE(2)-Equivariant Pushing Dynamics Models for Tabletop Object Manipulations  
**Seungyeon Kim**, Byeongdo Lim, Yonghyeon Lee, Frank C. Park  
Conference on Robot Learning (CoRL), **Oral presentation (33/504 = 6.5%)**, 2022
- [J2] DSQNet: A Deformable Model-Based Supervised Learning Algorithm for Grasping Unknown Occluded Objects  
**Seungyeon Kim**\*, Taegyun Ahn\*, Yonghyeon Lee, Jihwan Kim, Michael Y. Wang, Frank C. Park  
IEEE Transactions on Automation Science and Engineering (T-ASE), 2022
- [C1] A Statistical Manifold Framework for Point Cloud Data  
Yonghyeon Lee\*, **Seungyeon Kim**\*, Jinwon Choi, Frank C. Park  
International Conference on Machine Learning (ICML), 2022
- [J1] On the Encoding Capacity of Human Motor Adaptation  
**Seungyeon Kim**, Jaewoon Kwon, Jin-Min Kim, Frank C. Park, Sang-Hoon Yeo  
Journal of Neurophysiology (JNP), 2021

## PROJECTS

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|---|------------------------------|
| <b>Object Grasping and Manipulation Skills for Stable Housekeeping Service</b>  | <i>Sep 2021 - Oct 2022</i>   |
| <i>Project Leader</i>   | <i>with Samsung Research</i> |
| <ul style="list-style-type: none"> <li>• Develop prehensile and non-prehensile manipulation skills for handling various tableware objects on the table, as part of household tasks [C2].</li> </ul>                   |                              |
| <b>Deep Learning-based Lane Detection Algorithm from LiDAR data</b>   | <i>Apr 2021 - Oct 2021</i>   |
| <i>Project Leader</i>   | <i>with Seoul Robotics</i>   |
| <ul style="list-style-type: none"> <li>• Develop a deep neural network architecture that recognizes 3D lane information from LiDAR data.</li> </ul>   |                              |
| <b>Artificial Intelligence-based Automated Painting Robot System</b>  | <i>Oct 2020 - Sep 2021</i>   |
| <i>Project Member</i>   | <i>with Doolim-Yaskawa</i>   |
| <ul style="list-style-type: none"> <li>• Develop an artificial intelligence-based smart painting robot automation system for automobile factories, primarily responsible for visualizing painting results.</li> </ul> |                              |

**Babymind: Infant-Mimic Neurocognitive Developmental Machine Learning***Apr 2019 - Dec 2020**Project Leader**with SNU-AIIS*

- Build infant-mimicking neurocognitive AI technologies for robot manipulation in real-world environments.  
Conduct research on human motion primitives [J1] and baby-inspired grasping skills [J2].

**Deep Reinforcement Learning Algorithm for Industrial Robot***Apr 2018 - Dec 2018**Project Leader**with Samsung Electronics*

- Develop a safe and efficient reinforcement learning algorithm for high-gain position controller-based industrial robots.

**TEACHING EXPERIENCE**

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**Geometric Methods for High-Dimensional Data Analysis (M3239.006800)***Fall 2022*

Teaching Assistant in Seoul National University

**Dynamics (446.204A)***Fall 2018*

Teaching Assistant in Seoul National University

**Introduction to Robotics (M2794.0027)***Spring 2017*

Teaching Assistant in Seoul National University

**Basic Calculus 1 (033.016)***Spring 2015*

Undergraduate Student Instructor in Seoul National University

**Basic Calculus 2 (033.017)***Fall 2014*

Undergraduate Student Instructor in Seoul National University

**REFERENCES**

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**Frank C. Park** (*fcp@snu.ac.kr*)

Professor, Mechanical Engineering, Seoul National University

**Sang-Hoon Yeo** (*s.yeo@bham.ac.uk*)

Lecturer, School of Sport, Exercise and Rehabilitation Sciences, University of Birmingham

*Last updated: October 18, 2025*