

Obin Kwon

Contact Information	Postdoc in Kinetic Intelligent Machine LAB (KIMLAB) , University of Illinois Urbana-Champaign, Champaign, Illinois, United States. E-mail: obin.kwon000@gmail.com Linkedin: https://www.linkedin.com/in/obin-kwon-a99a37193/ Homepage: https://obin-hero.github.io Mobile: +1 (217)-693-2387
Research Area	Embodied AI, Robot Learning, Perception for Robots - Scene Representation for Robot Policy - Decision Making, Imitation Learning, Reinforcement learning - Visual Localization and Mapping
Skills	Programming Language: Python, C++, MATLAB Software: ROS, PyTorch, TensorFlow, OpenCV
Experience	KIMLAB , Postdoctoral Research Associate. July. 2024 - Now - Champaign, Illinois, United States - Advisor: Prof. Joohyung Kim (joohyung@illinois.edu) - Developing diverse teleoperation interfaces and robot learning framework for household tasks. Sequor Robotics , AI/Robotics Researcher. Oct. 2023 - June. 2024 - Seoul, Korea - Developed a vision-based robot localization and navigation system in warehouses. NAVER LABS , Research Intern. Jan. 2023 - July. 2023 - Seongnam, Korea - Developed a visual localization system based on simple wayfinding maps.
Education	M.S.&Ph.D. in Electrical and Computer Engineering 2018 - 2024 - Seoul National University, Seoul, Korea - Advisor: Prof. Songhwai Oh (songhwai@snu.ac.kr) - Dissertation Title: <i>“Scene Representation Learning for Visual Navigation”</i> (Distinguished Dissertation Award) B.S. in Electrical and Computer Engineering 2014 - 2018 - Seoul National University, Seoul, Korea
Publications	Jeongho Park, Obin Kwon , and Songhwai Oh, “Spatially-Conditional 3D Furniture Generation Model for Indoor Scene Generation,” <i>IEEE International Conference on Control, Automation and Systems (ICCAS)</i> , Oct. 2024. Keywords: Scene Generation, 3D Model Generation Minsoo Kim, Obin Kwon , Howoong Jun, and Songhwai Oh, “RNR-Nav: A Real-World Visual Navigation System Using Renderable Neural Radiance Maps,” <i>IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)</i> , Oct. 2024. (Oral Presentation, Accepted)

Keywords: Visual Navigation, Localization and Mapping, Neural Rendering, 3D Reconstruction

Obin Kwon, Dongki Jung, Youngji Kim, Soohyun Ryu, Suyong Yeon, Songhwai Oh, Donghwan Lee, “WayIL: Image-based Indoor Localization with Wayfinding Maps”, *IEEE International Conference on Robotics and Automation (ICRA)*, 2024.

Keywords: Visual Localization, Tracking & State Estimation, BEV-map

Jeongho Park, **Obin Kwon** and Songhwai Oh “Attention-Based Randomized Ensemble Multi-Agent Q-Learning,” *IEEE International Conference on Control, Automation and Systems (ICCAS)*, Oct. 2023.

Keywords: Multi-Agent Reinforcement Learning, Ensemble Learning

Obin Kwon, Jeongho Park, and Songhwai Oh, “Renderable Neural Radiance Map for Visual Navigation,” *IEEE Conference on Computer Vision and Pattern Recognition (CVPR)*, Jun. 2023. (Highlight, Acceptance Rate: 2.5%)

Keywords: Visual Navigation, Localization and Mapping, Neural Rendering, 3D Reconstruction

Nuri Kim, **Obin Kwon**, Hwiyeon Yoo, Yunho Choi, Jeongho Park, and Songhwai Oh, “Topological Semantic Graph Memory for Image-Goal Navigation”, *Conference on Robot Learning (CoRL)*, Dec. 2022. (Oral, Acceptance Rate: 6.5%)

Keywords: Visual Navigation, Semantic Scene Graph, Object Detection, Graph-based Localization and Navigation.

Hyemin Ahn*, **Obin Kwon***, Kyungdo Kim, Jaeyeon Jeong, Howoong Jun, Hongjung Lee, Dongheui Lee, and Songhwai Oh, “Visually Grounding Language Instruction for History-Dependent Manipulation”, *IEEE International Conference on Robotics and Automation (ICRA)*, May. 2022. (* equal contribution)

Keywords: Vision and Language based Manipulation, Language Instruction Following

Obin Kwon, Nuri Kim, Yunho Choi, Hwiyeon Yoo, Jeongho Park, and Songhwai Oh, “Visual Graph Memory with Unsupervised Representation for Visual Navigation”, *IEEE/CVF International Conference on Computer Vision (ICCV)*, Oct. 2021.

Keywords: Visual Scene Graph, Graph-based Localization and Navigation, Imitation Learning, Reinforcement Learning

Obin Kwon and Songhwai Oh, “Image-Goal Navigation Algorithm using Viewpoint Estimation,” *IEEE International Conference on Control, Automation and Systems (ICCAS)*, Oct. 2021.

Keywords: Visual Navigation, Reinforcement Learning, Representation Learning

Minyoung Hwang, **Obin Kwon**, and Songhwai Oh, “Geometric Understanding of Reward Function in Multi-Agent Visual Exploration,” *IEEE International Conference on Control, Automation and Systems (ICCAS)*, Oct. 2021.

Keywords: Multi-Agent Reinforcement Learning, Exploration.

Obin Kwon and Songhwai Oh, “Learning to Use Topological Memory for Visual Navigation”, *IEEE International Conference on Control, Automation and Systems (ICCAS)*, Oct. 2020.

Keywords: Visual Scene Graph, Imitation Learning, Reinforcement Learning

Honors	Distinguished Dissertation Award	August 2024
	- Electrical and Computer Engineering, Seoul National University	
	Lecture & Research Scholarship	Spring 2024
	- Seoul National University	
	Brain Korea 21 Plus Scholarship	Fall 2020-Spring 2022, Fall 2023
	- Seoul National University	
	Kim Jeong-sik Special Scholarship	Spring 2015 - Fall 2017.
	- Kwanak Corporation, SNU Electrical and Computer Scholarship Foundation	
	- Full tuition + α	
	Merit-based University Admission Scholarship	Spring 2014
	- Yongin City Scholarship Foundation	
Research Experiences	Superhuman Multimodal Sensing for Manipulation,	2024 - Now
	- Funded by Toyota Research Institute	
	Robot Learning: Efficient, Safe, and Socially-Acceptable Machine Learning,	2019 - 2024
	- Funded by Ministry of Science and ICT (MSIT), Korea	
	AI Technology for Guidance of Mobile Robots with Uncertain Maps,	2019 - 2023
- Funded by Ministry of Science and ICT (MSIT), Korea		
	Autonomous Navigation Multi-Agent Deep Reinforcement Learning,	2020 - 2021
	- Funded by Hyundai Autoever	
Teaching Experiences	Teaching Assistant @ Seoul National University	
	- Deep Reinforcement Learning (Topics in Control and Automation)	Spring 2021
	- Theory and Lab of IoT, AI, and Big Data	Fall 2019
	- Introduction to Intelligent Systems	Fall 2018
Professional Services	Reviewer	
	- IEEE Robotics Science and Systems.	
	- IEEE Robotics & Automation Letters.	
	- IEEE Transactions on Robotics.	
	- IEEE Transactions on Pattern Analysis and Machine Intelligence.	
	- IEEE Transactions on Automation Science and Engineering.	
	- IEEE International Conference on Intelligent Robots and Systems.	
	- International Conference on Ubiquitous Robots	
	Talk	
	- Invited tech talk at NAVER, Feb, 2022.	
References	Prof. Joohyung Kim	
	- Associate Professor at Department of Electrical and Computer Engineering, University of Illinois Urbana-Champaign (UIUC). - Email: joohyung@illinois.edu	
	Prof. Songhwai Oh	

- Professor at Department of Electrical and Computer Engineering, Seoul National University (SNU).
- Email: songhwai@snu.ac.kr

Prof. Hyemin Ahn

- Assistant Professor at Artificial Intelligence Graduate School (AIGS), Ulsan National Institute of Science and Technology (UNIST)
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Prof. Sungjoon Choi

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