

Obin Kwon

Contact Information

Postdoc in [Kinetic Intelligent Machine LAB \(KIMLAB\)](#),
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Research Area

Embodied AI, Robot Learning, Perception for Robots
- Scene Representation for Robot Policy
- Imitation Learning, Reinforcement learning
- Vision-based Navigation, Vision-based Localization

Skills

Programming Language: Python, C++, MATLAB
Software Library: 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 vision-based robot localization and learning-based navigation system in warehouses.](#)

NAVER LABS, Research Intern. Jan. 2023 - July. 2023
- Seongnam, Korea
- [Developed a learning-based visual localization system based on 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: **“Scene Representation Learning for Visual Navigation”**
[\(Distinguished Dissertation Award\)](#)

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,” *IEEE International Conference on Control, Automation and Systems (ICCAS)*, 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,” *IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, 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 - Electrical and Computer Engineering, Seoul National University	August 2024
	Lecture & Research Scholarship - Seoul National University	Spring 2024
	Brain Korea 21 Plus Scholarship - Seoul National University	Fall 2020-Spring 2022, Fall 2023
	Kim Jeong-sik Special Scholarship - Kwanak Corporation, SNU Electrical and Computer Scholarship Foundation - Full tuition + α	Spring 2015 - Fall 2017.
	Merit-based University Admission Scholarship - Yongin City Scholarship Foundation	Spring 2014
Research Experiences	Superhuman Multimodal Sensing for Manipulation, - Funded by Toyota Research Institute	2024 - Now
	Robot Learning: Efficient, Safe, and Socially-Acceptable Machine Learning, - Funded by Ministry of Science and ICT (MSIT), Korea	2019 - 2024
	AI Technology for Guidance of Mobile Robots with Uncertain Maps, - Funded by Ministry of Science and ICT (MSIT), Korea	2019 - 2023
	Autonomous Navigation Multi-Agent Deep Reinforcement Learning, - Funded by Hyundai Autoever	2020 - 2021
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) - Email: hyemin.ahn@unist.ac.kr	
	Prof. Sungjoon Choi - Assistant Professor at Department of Artificial Intelligence, Korea University - Email: sungjoon-choi@korea.ac.kr	