

# SEUNGCHAN KIM

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Website: <https://seungchan-kim.github.io>

## EDUCATION

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### Carnegie Mellon University

Ph.D. Candidate at Robotics Institute

Advisor: Sebastian Scherer

Pittsburgh, PA

Sep 2020 - Present

### Brown University

M.S. in Computer Science

B.S. in Applied Mathematics & Computer Science

Advisor: George Konidaris

Providence, RI

Sep 2019 - May 2020

Sep 2013 - May 2019

## RESEARCH EXPERIENCE

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### CMU AirLab

Graduate Research Assistant

Pittsburgh, PA

Sep 2020 - Present

- Conducting research in artificial intelligence and robotics, toward a Ph.D.
- Focus on robot exploration & navigation, multi-robot systems, and embodied AI.

### Brown University Intelligent Robot Lab

Undergraduate Research Assistant

Providence, RI

Sep 2017 - May 2020

- Researched on deep reinforcement learning and model-based reinforcement learning.

## JOURNAL PUBLICATIONS

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### 1. Multi-Robot Multi-Room Exploration with Geometric Cue Extraction and Circular Decomposition

Seungchan Kim, Micah Corah, John Keller, Graeme Best, Sebastian Scherer

*IEEE Robotics and Automation Letters (RA-L)* 2023

*Presentation at International Conference on Robotics and Automation (ICRA)* 2024

### 2. Unsupervised Online Learning for Robotic Interestingness with Visual Memory

Chen Wang, Yuheng Qiu, Wenshan Wang, Yafei Hu, Seungchan Kim, Sebastian Scherer

*IEEE Transactions on Robotics (T-RO)* 2021

## CONFERENCE PUBLICATIONS

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### 1. MapEx: Indoor Structure Exploration with Probabilistic Information Gain from Global Map Predictions

Cherie Ho\*, Seungchan Kim\*, Brady Moon, Aditya Parandekar, Narek Harutyunyan, Chen Wang, Katia Sycara, Graeme Best, Sebastian Scherer

*Accepted, International Conference on Robotics and Automation (ICRA)* 2025

(\*: Equal Contributions)

### 2. AirDet: Few-Shot Detection without Fine-tuning for Autonomous Exploration

Bowen Li, Chen Wang, Pranay Reddy, Seungchan Kim, Sebastian Scherer

*European Conference on Computer Vision (ECCV)* 2022

### 3. Robotic Interestingness via Human-Informed Few-Shot Object Detection

Seungchan Kim, Chen Wang, Bowen Li, Sebastian Scherer

*IEEE/RSJ International Conference on Robotics and Systems (IROS)* 2022

### 4. DeepMellow: Removing the Need for a Target Network in Deep Q-Learning

Seungchan Kim, Kavosh Asadi, Michael Littman, George Konidaris

*International Joint Conference on Artificial Intelligence (IJCAI)* 2019

*Multidisciplinary Conference on Reinforcement Learning and Decision Making (RLDM)* 2019

## PREPRINTS, WORKSHOP PAPERS, EXTENDED ABSTRACTS

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- 1. Toward General-Purpose Robots via Foundation Models: A Survey and Meta-Analysis**  
Yafei Hu\*, Quanting Xie\*, Vidhi Jain\*, Jonathan Francis, Jay Patrikar, Nikhil Keetha, **Seungchan Kim**,  
Yaqi Xie, Tianyi Zhang, Hao-Shu Fang, Shibo Zhao, Shayegan Omidshafiei, Dong-Ki Kim,  
Ali-akbar Agha-mohammadi, Katia Sycara, Matthew Johnson-Roberson, Dhruv Batra, Xiaolong Wang,  
Sebastian Scherer, Chen Wang, Zsolt Kira, Fei Xia, Yonatan Bisk  
*arXiv preprint arXiv:2312.08782 (2023)*
- 2. Adaptive Temperature Tuning for Mellowmax in Deep Reinforcement Learning**  
**Seungchan Kim**, George Konidaris  
*NeurIPS 2019 Deep Reinforcement Learning Workshop*
- 3. Combating the Compounding-Error Problem with a Multi-step Model**  
Kavosh Asadi, Dipendra Misra, **Seungchan Kim**, Michael Littman  
*arXiv preprint arXiv:1905.13320 (2019)*
- 4. Removing the Target Network from Deep Q-Networks with the Mellowmax Operator**  
**Seungchan Kim**, Kavosh Asadi, Michael Littman, George Konidaris  
*International Conference on Autonomous Agents and Multiagent Systems (AAMAS) 2019*
- 5. Using Computational Analysis of Behavior to Discover Developmental Change in Memory-Guided Attention Mechanisms in Childhood**  
Dima Amso, Lakshmi Govindarajan, Pankaj Gupta, Heidi Baumgartner, Andrew Lynn, Kelley Gunther,  
Diego Placido, Tarun Sharma, Vijay Veerabadran, Kalpit Thakkar, **Seungchan Kim**, Thomas Serre  
*PsyArXiv. doi:10.31234/osf.io/gq4rt*

## ADVISING & MENTORING

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### Undergraduate Research

- Narek Harutyunyan (Brown University; CMU RISS Intern) Jun 2024 - Aug 2024
- Aditya Parandekar (BITS Pilani - Goa; Visiting Intern) Jun 2023 - Dec 2023

### TEACHING

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- Teaching Assistant, CMU 16-711 Kinematics, Dynamics, Control Jan 2023 - May 2023
- Teaching Assistant, CMU 16-833 Robot Localization and Mapping Jan 2022 - May 2022
- Teaching Assistant, Brown CSCI1430 Computer Vision Jan 2019 - May 2019
- Teaching Assistant, Brown CSCI0040 Scientific Computing and Problem Solving Jan 2015 - May 2015

## ACADEMIC ACTIVITIES

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### Organizer

- Tartan Planning Series Mar 2023 - May 2023

### Reviewer

- Robotics:** IJRR, IEEE RA-L, IROS 2024, ICRA 2023, 2025, IEEE MRS 2023
- Machine Learning:** ICLR 2021, 2023, NeurIPS 2021, 2022, AAAI 2021, ICML 2020

## INVITED TALKS

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### Spatial Reasoning and Semantic Representations for Intelligent Multi-Robot Exploration and Navigation

Resilient Intelligent Systems Lab, CMU (*Host: Wennie Tabib*) Nov 8th 2024

### An Alternative Softmax Operator for Deep Reinforcement Learning

Machine Intelligence Community (MIC) Conference, Boston University Sep 7th 2019

## MEDIA COVERAGE

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### Autonomous Aerial Robots Communicate, Prioritize Rooms in Multiroom Exploration

Marylee Williams, CMU School of Computer Science News Jul 2024