SEUNGCHAN KIM

Email: seungch2@andrew.cmu.edu
Website: https://seungchan-kim.github.io

EDUCATION

Carnegie Mellon University — Pittsburgh, PA
Ph.D. Student at Robotics Institute — Sep 2020 - Present
Advisor: Sebastian Scherer

Brown University — Providence, RI
M.S. in Computer Science — Sep 2019 - May 2020
B.S. in Applied Mathematics & Computer Science — Sep 2013 - May 2019
Advisor: George Konidaris

RESEARCH EXPERIENCE

CMU AirLab — Pittsburgh, PA
Graduate Research Assistant — 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 — Providence, RI
Undergraduate Research Assistant — Sep 2017 - May 2020

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

JOURNAL PUBLICATIONS

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

1. **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

2. **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

3. **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

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, Shibo Zhao, Yu-Quan Chong, Chen Wang, Katia Sycara, Matthew Johnson-Roberson,
   Dhruv Batra, Xiaolong Wang, Sebastian Scherer, 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

Undergraduate Research

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

TEACHING

- 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

Organizer

- Tartan Planning Series — Mar 2023 - May 2023

Reviewer

- **Robotics:** IJRR, IEEE RA-L, IROS, ICRA, MRS
- **Machine Learning:** ICLR, NeurIPS, AAAI, ICML

INVITED TALKS

An Alternative Softmax Operator for Deep Reinforcement Learning — Sep 2019
Machine Intelligence Community (MIC) Conference, Boston, MA

MEDIA COVERAGE

Autonomous Aerial Robots Communicate, Prioritize Rooms in Multiroom Exploration — Jul 2024
Marylee Williams, CMU School of Computer Science News