Jigang Kim

Email: jgkim2020@snu.ac.kr
LinkedIn: jigang-kim-434784272
Google Scholar: 30rnPb8AAAAJ
GitHub: github.com/jigangkim
Website: jigang.kim

last updated on Dec 5, 2023

Research interest

- **Reinforcement Learning**
- **Machine Learning**
- **Robotics**

Education

Seoul National University Seoul, Korea
Ph.D. Candidate in Mechanical and Aerospace Engineering 2018 – 2024

- Dissertation: Reinforcement Learning Framework with Minimal External Interventions for Autonomous Robot Learning
- Advisor: H. Jin Kim
- GPA: 4.08/4.30

Seoul National University Seoul, Korea
B.S. in Mechanical and Aerospace Engineering 2014 – 2018

- Thesis: Reconstructing locomotion in VR from WIP (Walking-In-Place) motion : an IMU-based, inside-out approach
- Advisor: Frank Chongwoo Park and Jinwook Kim
- GPA: 4.12/4.30

Experience

Korea Institute of Science and Technology (KIST) Seoul, Korea
Undergraduate Intern at Center for Imaging Media Research (IMRC) March, 2017 – November, 2017

- Locomotion Reconstruction in Virtual Reality

Projects

Transfer of Driving Dynamics Parameter between Car Models
Hyundai Motor Company April, 2022 –

Transfer Learning for Multi-agent Systems
Agency for Defense Development October, 2019 – October, 2021

BabyMind: Infant-Mimic Developmental Machine Learning
Korea Ministry of Science and ICT April, 2019 – December, 2020

RL Application of an A/C Unit via Domain Randomization
LG Electronics August, 2019 – November, 2020

Seoul National University Undergraduate Research Program
Sigma Intelligence (RAMMUS: Omni-directional Spherical Robot) March, 2016 – December, 2016

Seoul National University Undergraduate Research Program
Sigma Intelligence (SNU e-Wheel: Smart E-bike Conversion In-wheel Module) March, 2015 – December, 2015

KOFAC Undergraduate Creative Convergence Research Program
Sigma Intelligence (ISAC: Intelligent Self-Assembling Cobra) March, 2014 – December, 2014

Publications

[1] **J. Kim**, D. Cho, and H. J. Kim, "Demonstration-free autonomous reinforcement learning via implicit and bidirectional curriculum", in *Fortieth International Conference on Machine Learning*, 2023.

[2] **J. Kim**, D. Jang, and H. J. Kim, "Distributed multi-agent target search and tracking with gaussian process and reinforcement learning", *International Journal of Control, Automation and Systems*, vol. 21, no. 9, pp. 3057–3067, 2023.

[3] D. Cho, **J. Kim**, and H. J. Kim, "Unsupervised reinforcement learning for transferable manipulation skill discovery", *IEEE Robotics and Automation Letters*, 2022.

[4] **J. Kim**, J. H. Park, D. Cho, and H. J. Kim, "Automating reinforcement learning with example-based resets", *IEEE Robotics and Automation Letters*, 2022, **(oral presentation, ICRA 2023)**.

[5] S. Lee, **J. Kim**, I. Jang, and H. J. Kim, "Dhrl: A graph-based approach for long-horizon and sparse hierarchical reinforcement learning", in *Thirty-sixth Conference on Neural Information Processing Systems*, 2022, **(oral presentation, 184 out of 2672)**.

[6] J. H. Park, **J. Kim**, and H. J. Kim, "Spatio-semantic task recognition: Unsupervised learning of task-discriminative features for segmentation and imitation", *International Journal of Control, Automation and Systems*, vol. 19, no. 10, pp. 3409–3418, 2021.

[7] J. H. Park, **J. Kim**, Y. Jang, I. Jang, and H. J. Kim, "Learning transformable and plannable se (3) features for scene imitation of a mobile service robot", *IEEE Robotics and Automation Letters*, vol. 5, no. 2, pp. 1664–1671, 2020.

[8] S. Park, **J. Kim**, and H. J. Kim, "Zero-shot transfer learning of a throwing task via domain randomization", in *2020 20th International Conference on Control, Automation and Systems (ICCAS)*, IEEE, 2020, pp. 1026–1030.

[9] **J. Kim**, S. Choi, and H. J. Kim, "Fast and safe policy adaptation via alignment-based transfer", in *2019 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)*, IEEE, 2019, pp. 990–996.

[10] J.-H. Woo, **J. Kim**, D. Park, H.-J. Bae, J.-H. Kim, S.-E. Lee, S. C. Kim, and H.-J. Kwon, "Misclassified type 1 agns in the local universe", *Journal of The Korean Astronomical Society*, vol. 47, no. 5, pp. 167–178, 2014.

Honors, Awards, Scholarships

- Lecture & Research Scholarship 2020
- Brain Korea 21 Plus (BK21+) Research Scholarship 2018 – 2019
- Kwanjeong Educational Foundation (KEF) Domestic Scholarship 2018 – 2019
- Summa Cum Laude, Seoul National University 2018
- National Scholarship for Science and Engineering 2016 – 2017

- Excellence Award at Seoul National University Undergraduate Research Program (URP) 2016
- Encouragement Prize at Seoul National University Creative Design Competition 2016
- Encouragement Prize at KIPE 14th Intelligent Electronics (I.E) Competition 2016
- Top Prize at Seoul National University Creative Design Competition 2015
- Academic Excellence Scholarship 2014 – 2015
- Excellence Award at KOFAC Undergraduate Creative Convergence Research Program 2014
- Silver Prize at Seoul National University Electrical and Computer Engineering (SNU ECE) Contest 2014
- Bronze Prize at Samsung Techwin 2014 Robot Membership 2014
- Outstanding Freshman Scholarship 2014

Teaching

- **Teaching Assistant** at Seoul National University Fall 2018
  Introductory Engineering Probability (M2795.003400)
- **Tutor** at Seoul National University Spring 2017
  Basic Physics 1(034.012)

Extracurricular Activities

- Sigma Intelligence, Seoul National University 2014 – 2017
  Participated in undergrad research/competition as a hobby roboticist (hardware design/programming)
- Seoul National University Philharmonic Orchestra (SNUPO) Winter 2014
  Performed as an amateur violist at the 46th regular concert

Skills

- **Programming Languages:** Python, C/C++, MATLAB, Simulink
- **Frameworks:** PyTorch, TensorFlow, ROS
- **Tools:** Git, Onshape, SOLIDWORKS

Languages

- **Language: English** (native-level proficiency)
  - **TEPS (Test of English Proficiency):** 585 (1+ level) out of 600 (expired)
  - **TOEFL (Test of English as a Foreign Language):** 110 out of 120 (expired)
- **Language: Korean** (native)
- **Language: Chinese** (elementary)