DOHYEONG KIM

Ph.D. Candidate
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RESEARCH INTERESTS

My research goal is to enable robots to cooperate safely and efficiently with people. My interest areas are the followings: safe reinforcement learning, learning from demonstrations, and applications in legged robots and manipulators.

EDUCATION

Ph.D. in Electrical and Computer Engineering Mar 2020 - Feb 2026 (Anticipated)
Seoul National University, Seoul, South Korea
Advisor: Prof. Songhwai Oh

B.S. in Electrical and Computer Engineering Mar 2012 - Aug 2019
Seoul National University, Seoul, South Korea
Graduate with honor (Cum Laude)

RESEARCH EXPERIENCE

Graduate Research Assistant Mar 2020 - Present
Robot Learning Lab, Seoul National University
- Developed a safe reinforcement learning algorithm. (code, video)
- Implemented a constrained model predictive controller for autonomous driving. (code)
- Implemented a Gazebo simulation for a robotic arm with a gripper. (code)

Undergraduate Research Assistant Jan 2019 - Feb 2020
Robot Learning Lab, Seoul National University
- Developed an imitation learning algorithm using demonstrations with mixed qualities. (video)

PUBLICATIONS

Journal

- **Dohyeong Kim** and Songhwai Oh, "Efficient Off-Policy Safe Reinforcement Learning Using Trust Region Conditional Value at Risk," IEEE Robotics and Automation Letters, vol. 7, no. 3, pp. 7644-7651, Jul. 2022.
- **Dohyeong Kim** and Songhwai Oh, "TRC: Trust Region Conditional Value at Risk for Safe Reinforcement Learning," IEEE Robotics and Automation Letters, vol. 7, no. 2, pp. 2621-2628, Apr. 2022.

Conference

- **Dohyeong Kim**, Kyungjae Lee, and Songhwai Oh, "Trust Region-Based Safe Distributional Reinforcement Learning for Multiple Constraints," in Proc. of Neural Information Processing Systems (NeurIPS), Dec. 2023.
- Junseo Lee, Jaeseok Heo, **Dohyeong Kim**, Gunmin Lee, and Songhwai Oh, "Dual Variable Actor-Critic for Adaptive Safe Reinforcement Learning," in Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2023.

- Hogun Kee, Minjae Kang, **Dohyeong Kim**, Jaegoo Choy, and Songhwai Oh, "SDF-Based Graph Convolutional Q-Networks for Rearrangement of Multiple Objects," in Proc of the IEEE International Conference on Robotics and Automation (ICRA), May 2023.
- Gunmin Lee, Wooseok Oh, Jeongwoo Oh, Seungyoun Shin, **Dohyeong Kim**, Jaeyeon Jeong, Sungjoon Choi, and Songhwai Oh "Semi-Supervised Imitation Learning with Mixed Qualities of Demonstrations for Autonomous Driving," in Proc. of the International Conference on Control, Automation and Systems (ICCAS), Nov. 2022.
- **Dohyeong Kim***, Jaeseok Heo*, and Songhwai Oh, "SafeTAC: Safe Tsallis Actor-Critic Reinforcement Learning for Safer Exploration," in Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2022.
- **Dohyeong Kim**, Yunho Kim, Kyungjae Lee, and Songhwai Oh, "Safety Guided Policy Optimization," in Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2022.
- **Dohyeong Kim** and Songhwai Oh, "Efficient Off-Policy Safe Reinforcement Learning Using Trust Region Conditional Value at Risk," IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2022. (RA-L option)
- **Dohyeong Kim** and Songhwai Oh, "TRC: Trust Region Conditional Value at Risk for Safe Reinforcement Learning," IEEE International Conference on Robotics and Automation (ICRA), May 2022. (RA-L option)
- Hogun Kee, **Dohyeong Kim**, and Songhwai Oh, "Decomposed Q-Learning for Non-Prehensile Rearrangement Problem," in Proc. of the International Conference on Control, Automation and Systems (ICCAS), Oct. 2021.
- Timothy Ha, Gunmin Lee, **Dohyeong Kim**, and Songhwai Oh, "Road Graphical Neural Networks for Autonomous Roundabout Driving," in Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Sep. 2021.
- Gunmin Lee*, **Dohyeong Kim***, Wooseok Oh, Kyungjae Lee, and Songhwai Oh, "MixGAIL: Autonomous Driving Using Demonstrations with Mixed Qualities," in Proc. of the IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), Oct. 2020.

WORK EXPERIENCE

SNOW Inc., Seoul, South Korea — Aug 2018 - Nov 2018
Corporation that provides several AR camera app services
Position: New Business Unit Program Developer Internship
- Developed an AI-based face swap program.

Conalog Co., Ltd., Seoul, South Korea — Dec 2017 – Jul 2018
Startup of low energy IoT sensor based on piezoelectric element
Position: Technology Development Manager
- Developed a low power firmware and Bluetooth-based Beacon application.
- Developed a wireless secure communication method under low power environments.

TEACHING EXPERIENCE

Teaching Assistant, Seoul National University
Course: Theory and Lab of IoT, AI, and Big Data — Spring 2020

ACADEMIC SERVICES

Reviewer
- IEEE Robotics and Automation Letters — 2020 - 2022
- IEEE Transactions on Robotics — 2021

- IEEE International Conference on Robotics and Automation 2021-2023
- Robotics: Science and Systems 2022

PATENT

- [10-2018-0018801] "Beacon-Based Remote Control System and Method with High Level Security in Low Power Environment", *South Korea*, granted Oct. 2018.

HONORS AND AWARDS

- Scholarships Granted By College Department 2020-2021
- International Quant Championship National Finalist 2019
- On-campus Tutoring Scholarship 2017
- Army Sergent, Honorable Discharge 2017
- Korea Scholarships Foundation 2012-2016
- Junior Young Physicists' Tournament 3rd Prize 2010

SKILLS

Programming: C/C++, Python, JavaScript, MATLAB
Softwares: ROS, TensorFlow, PyTorch, ReactJS, PyBullet, MuJoCo, SolidWorks
Languages: Korean (native), English (intermediate)