

Min-Sung Yoon

Ph.D. candidate

Email: minsung.yoon@kaist.ac.kr

SGVR Lab @ School of Computing,

URL: <https://minsungyoon.github.io/>

Korea Advanced Institute of Science and Technology (KAIST)

Research Interests:

I am particularly interested in increasing the autonomy of robots in various ways: 🏠 → 🤖 + 🧠. My research interest spans the following keywords: Reinforcement learning, Deep learning, Robotics, Motion generation, Task and Motion planning, Control, Navigation, Graphics, etc.

Awards & Honors:

- **Outstanding Planning Paper Award, ICRA, 2023**
 - Paper: Learning-based Initialization of Trajectory Optimization for Path-following Problems of Redundant Manipulators
 - (About 1.1% acceptance rate, 15 awards out of 1,341 papers)
- **Outstanding Navigation Paper Finalist Award, ICRA, 2022**
 - Paper: Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning
 - (About 2.6% acceptance rate, 39 awards out of 1,498 papers)
- **Best Design Award for Comprehensive Information and Communication Design (Graduation Project), ICE Department in Inha Univ., 2018**
 - Title: Platooning with Autonomous Driving
- **National Excellence Scholarship in Science and Engineering (이공계 국가우수 장학생), Ministry of Science and ICT (과학기술정보통신부), 2017**
- **Dean's List, College of IT Engineering in Inha Univ., 2016 Fall**
- **Dean's List, College of IT Engineering in Inha Univ., 2016 Spring**

Education:

- **KAIST, Ph.D., Computer Science** **2022 ~ current**
 - Scalable Graphics, Vision, & Robotics Lab (SGVR Lab)
 - Adviser: Sung-Eui Yoon
- **KAIST, M.S., Computer Science** **2020 ~ 2022**
 - Scalable Graphics, Vision, & Robotics Lab (SGVR Lab),
 - Adviser: Sung-Eui Yoon
 - Total GPA: 4.0/4.3 (credits: 34)
- **Inha Univ., B.S., Information & Communication Engineering (ICE)** **2015 ~ 2019**
 - Major GPA: 4.49/4.5 (credits: 80), Total GPA: 4.34/4.5 (credits: 130)

Publications:

- **Learning-based Initialization of Trajectory Optimization for Path-following Problems of Redundant Manipulators** [\[Project page\]](#)
 - Minsung Yoon, Mincheul Kang, Daehyung Park, and Sung-Eui Yoon
 - IEEE International Conference on Robotics and Automation (ICRA) 2023
 - **Outstanding Planning Paper Award** (about 1.1% rate, 15 awards out of 1,341 papers)
- **Towards Safe Remote Manipulation: User Command Adjustment based on Risk Prediction for Dynamic Obstacles** [\[Project page\]](#)
 - Mincheul Kang, **Minsung Yoon**, and Sung-Eui Yoon
 - IEEE International Conference on Robotics and Automation (ICRA) 2023
- **Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning** [\[Project page\]](#)
 - Hyeongyeol Ryu, **Minsung Yoon**, Daehyung Park, and Sung-Eui Yoon
 - IEEE International Conference on Robotics and Automation (ICRA) 2022
 - **Outstanding Navigation Paper Finalist Award** (about 2.6% rate, 39 awards out of 1,498 papers)
- **Fast and Robust Trajectory Generation for Cartesian Path-following Problems of Redundant Manipulators**
 - **Minsung Yoon**, Mincheul Kang, Daehyung Park, and Sung-Eui Yoon
 - Machine Learning for Human-Robot Interaction (HRI) Workshop at IEEE International Symposium on Robot and Human Interactive Communication (RO-MAN) 2022
- **Deep Neural Network-based Fast Motion Planning Framework for Quadrupedal Robot** [\[Workshop video\]](#)
 - Jinhyeok Jang, Heechan Shin, **Minsung Yoon**, Seungwoo Hong, Hae-Won Park, and Sung-Eui Yoon
 - Machine Learning for Motion Planning (MLMP) Workshop at ICRA 2021
- **Robust Robot Navigation against External Disturbance using Deep Reinforcement Learning** [\[Project page\]](#)
 - Hyeongyeol Ryu, **Minsung Yoon**, Daehyung Park, and Sung-Eui Yoon
 - Korea Robotics Society Annual Conference (KRoC), 2021
- **Bias tree expansion using reinforcement learning for efficient motion planning** [\[Project page\]](#)
 - **Minsung Yoon**, Daehyung Park, and Sung-Eui Yoon
 - Korea Robotics Society Annual Conference (KRoC), 2021

Media Coverages: ---

- **KAIST's Research Highlights on the 2023 KAIST Annual R&D Report** [\[Link\]](#)
- **KAIST's Research news** [\[Link\]](#)
- **CS Department's news** [\[Link\]](#)
- **Research Highlights of the Department of Computing Science (CS) at KAIST** [\[Link\]](#)

Research Activities & Experiences: ---

- **Teaching Assistant**
 - CS470: Introduction to Artificial Intelligence, Spring 2023
 - CS470: Introduction to Artificial Intelligence, Fall 2022
- Gave an **invited talk** at Flagship Conference / Journal Session of KRoC 2023. [\[Link\]](#)

Patents: ---

- TBU

Projects: ---

- TBU

Skills: ---

- **Programming Language:** C, C++, Python, MATLAB
- **Programming Library:** ROS 1, ROS 2, PyTorch, Tensorflow, Keras, RL frameworks (e.g., OpenAI Gym, OpenAI spinningup), Moveit, OMPL (Open Motion Planning Library)
- **Simulator & Physics Engine:** Gazebo, Mujoco, Raisim, IsaacGym, IsaacSim, DART
- **Experienced Robot Platform:** Mobile manipulator (i.e., Fetch robot), Quadruped robot (i.e., Go1 robot), Mobile robot (i.e., Jackal robot)