Min-Sung Yoon

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SGVR Lab @ School of Computing, **URL:** https://minsungyoon.github.io/
Korea Advanced Institute of Science and Technology (KAIST)

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, 1st place), ICE, 2018**
  - Title: Platooning with Autonomous Driving
    Team members: Minsung Yoon, 박준영, and 최재영 | Advised by Prof. 김덕경
- **National Science & Technology Scholarship, Ministry of Science and ICT, 2017**
  - Full funding in 5-8th semesters
- **Dean's List, College of IT Engineering in Inha Univ., 2016 Fall**
- **Dean's List, College of IT Engineering in Inha Univ., 2016 Spring**
- **Academic Excellence Scholarship, ICE**
  - Full funding in the 3rd and 4th semesters
  - Two thirds funding for 2nd semesters

Education:

- **KAIST, Ph.D., Computer Science** **2022 ~ current**
  - Scalable Graphics, Vision, & Robotics Lab (SGVR Lab)
  - Adviser: Sung-Eui Yoon
  - Total GPA: 4.1/4.3 (under progressing)
- **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: 4.48/4.5 (credits: 74), Total GPA: 4.34/4.5 (credits: 130)

- **Unofficial Transcript for glancing my academic background :)** [google sheet]

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 Research Highlights: 2023 KAIST Annual R&D Report** [Link]
- **KAIST Research News** [Link]
- **CS Department News (KAIST)** [Link]
- **CS Department Research Highlights (KAIST)** [Link]

Research Activities & Experiences:

- **Teaching Assistant**
  - CS686: Robot Motion Planning and Applications, Fall 2023, Prof. Sung-eui Yoon (under progressing)
  - CS470: Introduction to Artificial Intelligence, Spring 2023, Prof. Daehyung Park
  - CS470: Introduction to Artificial Intelligence, Fall 2022, Prof. Daehyung Park

- Gave **an invited talk** at Flagship Conference / Journal Session of KRoC 2023. [Link]

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, Orbit, Habitat
- **Physically Experienced Robot Platform**: Mobile manipulator (i.e., Fetch robot), Quadruped robot (i.e., Go1 robot), Mobile robot (i.e., Jackal robot)