

# Min-Sung Yoon

PH.D. CANDIDATE · SCHOOL OF COMPUTING (SoC), KAIST  
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**“Passionate about bridging AI and robotics to enhance quality of life.”**

**Research Keywords:** motion & path planning, deep reinforcement learning, navigation under uncertainty, energy-efficient multi-modal locomotion, and safe remote manipulation

## Education

### KAIST (Korea Advanced Institute of Science and Technology)

PH.D. IN COMPUTER SCIENCE

- Advisor: Prof. Sung-Eui Yoon
- Total GPA: 4.1 / 4.3

Daejeon, South Korea

Mar. 2022 – Present

### KAIST (Korea Advanced Institute of Science and Technology)

M.S. IN COMPUTER SCIENCE

- Advisor: Prof. Sung-Eui Yoon
- Total GPA: 4.0 / 4.3

Daejeon, South Korea

Mar. 2020 – Feb. 2022

### Inha University

B.S. IN INFORMATION AND COMMUNICATION ENGINEERING (ICE)

- Major GPA: 4.48 / 4.5, Total GPA: 4.34 / 4.5

Incheon, South Korea

Mar. 2015 – Feb. 2019

## Honors & Awards

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|------|--|---------|
| 2023 | <b>Outstanding Planning Paper Award</b> , IEEE International Conference on Robotics and Automation (ICRA)<br>Title: “Learning-based Initialization of Trajectory Optimization for Path-following Problems of Redundant Manipulators” | UK      |
| 2022 | <b>Outstanding Navigation Paper Finalist Award</b> , IEEE International Conference on Robotics and Automation (ICRA)<br>Title: “Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning”           | USA     |
| 2018 | <b>Best Comprehensive Design Award (1st Place, Graduation Project)</b> , Inha University, ICE<br>Title: “Platooning with Autonomous Driving”   | S.Korea |
| 2017 | <b>National Science &amp; Technology Scholarship</b> , Ministry of Science and ICT<br>Full funding support for 5th–8th semesters   | S.Korea |
| 2016 | <b>Dean’s List</b> , Inha University, College of IT Engineering (Fall Semester)  | S.Korea |
| 2016 | <b>Dean’s List</b> , Inha University, College of IT Engineering (Spring Semester)  | S.Korea |
| 2016 | <b>Academic Excellence Scholarship</b> , Inha University, ICE<br>Full funding support for 3rd–4th semesters  | S.Korea |
| 2015 | <b>Academic Excellence Scholarship</b> , Inha University, ICE<br>Two-thirds funding support for 2nd semester   | S.Korea |

## Publications

### International Papers

#### [1] Enhancing Navigation Efficiency of Quadruped Robots via Leveraging Personal Transportation Platforms

MINSUNG YOON AND SUNG-EUI YOON

IEEE International Conference on Robotics and Automation (ICRA), 2025

#### [2] Learning-based Adaptive Control of Quadruped Robots for Active Stabilization on Moving Platforms

MINSUNG YOON, HEECHAN SHIN, JEIL JEONG, AND SUNG-EUI YOON

IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS), 2024

Agile Robotics Workshop @ ICRA, 2024

#### [3] Navigation Among Movable Obstacles with Mobile Manipulator using Learned Robot-Obstacle Interaction Model

TAEGEUN YANG, MINSUNG YOON, JEIL JEONG, AND SUNG-EUI YOON

Mobile Manipulation and Embodied Intelligence (MOMA.v2) Workshop @ ICRA, 2024

#### [4] Analysis of Terrain-Aware Optimal Path Planning Methods for Stable Off-Road Navigation

**MINSUNG YOON**, TAEGEUN YANG, CHANMI LEE, HYUNSIK SON, AND SUNG-EUI YOON  
Off-Road Autonomy Workshop @ IEEE Intelligent Vehicles Symposium (IV), 2024

#### [5] Learning-based Initialization of Trajectory Optimization for Path-following Problems of Redundant Manipulators

**MINSUNG YOON**, MINCHEUL KANG, DAEHYUNG PARK, AND SUNG-EUI YOON  
IEEE International Conference on Robotics and Automation (ICRA), 2023 – *Outstanding Planning Paper Award, Top 1.1% (15 of 1,345 papers)*

#### [6] Towards Safe Remote Manipulation: User Command Adjustment based on Risk Prediction for Dynamic Obstacles

MINCHEUL KANG, **MINSUNG YOON**, AND SUNG-EUI YOON  
IEEE International Conference on Robotics and Automation (ICRA), 2023

#### [7] Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning

HYEONGYEOL RYU, **MINSUNG YOON**, DAEHYUNG PARK, AND SUNG-EUI YOON  
IEEE International Conference on Robotics and Automation (ICRA), 2022 – *Outstanding Navigation Paper Finalist Award, Top 2.7% (39 of 1,428)*  
Selected as one of the *KAIST 2023 Research Highlights*

#### [8] 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 @ IEEE RO-MAN, 2022

#### [9] Deep Neural Network-based Fast Motion Planning Framework for Quadrupedal Robot

JINHYEOK JANG, HEECHAN SHIN, **MINSUNG YOON**, SEUNGWOO HONG, HAE-WON PARK, AND SUNG-EUI YOON  
Machine Learning for Motion Planning (MLMP) Workshop @ ICRA, 2021

### Domestic (Korean) Papers

#### [10] Adversarial Attack on Visuomotor Policy

CHANMI LEE, **MINSUNG YOON**, AND SUNG-EUI YOON  
Korea Computer Congress (KCC), 2024

#### [11] Manipulator-Assisted Navigation Among Movable Obstacles using Learned Robot-Obstacle Kinodynamics Model

TAEGEUN YANG, **MINSUNG YOON**, AND SUNG-EUI YOON  
Korea Robotics Society Annual Conference (KRoC), 2024

#### [12] Robust Robot Navigation against External Disturbance using Deep Reinforcement Learning

HYEONGYEOL RYU, **MINSUNG YOON**, DAEHYUNG PARK, AND SUNG-EUI YOON  
Korea Robotics Society Annual Conference (KRoC), 2021

#### [13] Bias Tree Expansion using Reinforcement Learning for Efficient Motion Planning

**MINSUNG YOON**, DAEHYUNG PARK, AND SUNG-EUI YOON  
Korea Robotics Society Annual Conference (KRoC), 2021

## Patents

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#### [1] Learning-based Adaptive Control of Quadruped Robots for Active Stabilization on Moving Platforms

(APPLICATION IN PROGRESS)

#### [2] Learning-based Initialization of Trajectory Optimization for Redundant Manipulators' Path-Following Problem

KR 10-2023-0192803, PATENT APPLICATION FILED ON DEC. 27, 2023

#### [3] User Command Adjustment Based on Risk Prediction of Dynamic Obstacles for Safe Remote Manipulation

KR 10-2023-0169134, PATENT APPLICATION FILED ON NOV. 29, 2023

## Talks & Presentations

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#### Presented tutorial talks at Korea Robotics Society Annual Conference (KRoC)

Feb. 2025

– TITLE: REINFORCEMENT LEARNING TECHNIQUES AND APPLICATIONS FROM ROBOTIC ARMS TO QUADRUPEL ROBOTS

#### Presented tutorial talks at Korea Computer Congress (KCC)

Jun. 2024

– TITLE: INTRODUCTION TO REINFORCEMENT LEARNING AND ITS APPLICATIONS IN ROBOTIC MANIPULATION

#### Presented an invited talk at the Flagship Conference / Journal Session of KRoC 2023

Feb. 2023

– TITLE: CONFIDENCE-BASED ROBOT NAVIGATION UNDER SENSOR OCCLUSION WITH DEEP REINFORCEMENT LEARNING

## Teaching Experience

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### Teaching Assistance (TA)

## Robot Motion Planning and Applications (CS586), KAIST School of Computing

– LECTURER: PROF. SUNG-EUI YOON

Spring 2025

## Robot Motion Planning and Applications (CS686), KAIST School of Computing

– LECTURER: PROF. SUNG-EUI YOON

Fall 2023

## Introduction to Artificial Intelligence (CS470), KAIST School of Computing

– LECTURER: PROF. DAEHYUNG PARK

Spring 2023

## Introduction to Artificial Intelligence (CS470), KAIST School of Computing

– LECTURER: PROF. DAEHYUNG PARK

Fall 2022

## Research Projects

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### EchoHound: Sonar-based Autonomous Navigation

SUPPORTED BY DSO NATIONAL LABORATORIES, SINGAPORE

Mar. 2025 – Present

### Autonomous Off-Road Navigation

SUPPORTED BY HANWHA AEROSPACE

Jun. 2023 – Present

### Task-Optimal Motion Planning for Robots

SUPPORTED BY HYUNDAI HEAVY INDUSTRIES

Mar. 2020 – Feb. 2021

### Development of Quadruped Robot System Technology

SUPPORTED BY AGENCY FOR DEFENSE DEVELOPMENT (ADD)

Oct. 2019 – Sep. 2024

### Recognition, Action and Interaction Algorithms for Open-world Robot Service

SUPPORTED BY STARLAB FUNDED BY MINISTRY OF SCIENCE AND ICT (MSIT) VIA INFORMATION & COMMUNICATIONS TECHNOLOGY PLANNING & EVALUATION (IITP)

Apr. 2023 – Present

### Visual-Acoustic Understanding and Planning Based on Realistic Modeling

SUPPORTED BY NATIONAL RESEARCH FOUNDATION OF KOREA (NRF) FUNDED BY MSIT

Mar. 2023 – Present

### AiA (AI in Action): Autonomous Action Planning AI Lab

SUPPORTED BY BASIC RESEARCH LABORATORY (BRL) FUNDED BY MSIT VIA NRF

Jun. 2021 – Feb. 2024

### Understanding, Localization, and Planning Based on Modeling and Rendering

SUPPORTED BY NRF FUNDED BY MSIT

Mar. 2019 – Feb. 2023

### Proximity Computing and Its Applications to Autonomous Vehicles, Image Search, and 3D Printing

SUPPORTED BY STARLAB FUNDED BY MSIT VIA IITP

Mar. 2015 – Dec. 2022

## Media Coverage

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### Featured in KAIST Alumni News

RECOGNIZED FOR RESEARCH PRESENTED AT ICRA 2023, RECIPIENT OF THE OUTSTANDING PLANNING PAPER AWARD

May 2024

### Featured in KAIST 2023 Research Highlights

RECOGNIZED FOR RESEARCH PRESENTED AT ICRA 2022, FINALIST FOR THE OUTSTANDING NAVIGATION PAPER AWARD

Jul. 2023

### Featured in KAIST Research News

RECOGNIZED FOR RESEARCH PRESENTED AT ICRA 2023, RECIPIENT OF THE OUTSTANDING PLANNING PAPER AWARD

Jun. 2023

### Featured in KAIST CS Department News

RECOGNIZED FOR RESEARCH PRESENTED AT ICRA 2023, RECIPIENT OF THE OUTSTANDING PLANNING PAPER AWARD

Jun. 2023

### Featured in KAIST CS Department Research Highlights

RECOGNIZED FOR RESEARCH PRESENTED AT ICRA 2022, FINALIST FOR THE OUTSTANDING NAVIGATION PAPER AWARD

Jun. 2022

## Skills

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<b>Programming</b>	C, C++, Python, MATLAB
<b>Libraries &amp; Frameworks</b>	PyTorch, TensorFlow, Keras, OMPL, MoveIt
<b>Simulation Platforms</b>	Gazebo, Mujoco, Raisim, DART, IsaacGym/Sim/Lab, Habitat
<b>Experienced Robot Platforms</b>	Fetch, Go1, Jackal, Bunker Pro
<b>Middleware</b>	ROS 1, ROS 2
<b>Languages</b>	Korean (Native), English