Min-Sung **Yoon**

PH.D. CANDIDATE · SCHOOL OF COMPUTING (SOC), KAIST

Bldg E3-1, 291 Daehak-ro, Yuseong-gu, Daejeon 34141, South Korea

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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) — *Daejeon, South Korea*

PH.D. IN COMPUTER SCIENCE — *Mar. 2022 – Present*

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

KAIST (Korea Advanced Institute of Science and Technology) — *Daejeon, South Korea*

M.S. IN COMPUTER SCIENCE — *Mar. 2020 – Feb. 2022*

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

Inha University — *Incheon, South Korea*

B.S. IN INFORMATION AND COMMUNICATION ENGINEERING (ICE) — *Mar. 2015 – Feb. 2019*

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

Honors & Awards

2023 **Outstanding Planning Paper Award,** IEEE International Conference on Robotics and Automation (ICRA) — *UK*
Title: "Learning-based Initialization of Trajectory Optimization for Path-following Problems of Redundant Manipulators"

2022 **Outstanding Navigation Paper Finalist Award,** IEEE International Conference on Robotics and Automation (ICRA) — *USA*
Title: "Confidence-Based Robot Navigation Under Sensor Occlusion with Deep Reinforcement Learning"

2018 **Best Comprehensive Design Award (1st Place, Graduation Project),** Inha University, ICE — *S.Korea*
Title: "Platooning with Autonomous Driving"

2017 **National Science & Technology Scholarship,** Ministry of Science and ICT — *S.Korea*
Full funding support for 5th–8th semesters

2016 **Dean's List,** Inha University, College of IT Engineering (Fall Semester) — *S.Korea*

2016 **Dean's List,** Inha University, College of IT Engineering (Spring Semester) — *S.Korea*

2016 **Academic Excellence Scholarship,** Inha University, ICE — *S.Korea*
Full funding support for 3rd–4th semesters

2015 **Academic Excellence Scholarship,** Inha University, ICE — *S.Korea*
Two-thirds funding support for 2nd semester

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

[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

[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

Under Review

[14] Metaheuristic Asphalt Crack Sealing Path Planning based on Discrete Grey Wolf Optimizer

[15] ALaM: Adaptive Locomotion and Manipulation for Quadruped Robot

[16] LangPert: Detecting and Handling Task-level Perturbations for Robust Object Rearrangement

[17] Efficient Navigation Among Movable Obstacles using a Mobile Manipulator via Hierarchical Policy Learning

[18] Spatial-Temporal Coherence Processing for Multi-Object Association in Fixed-Wing Drone Swarms

Patents

[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

Presented tutorial talks at Korea Robotics Society Annual Conference (KRoC) *Feb. 2025*

– Title: Reinforcement Learning Techniques and Applications from Robotic Arms to Quadruped 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

Teaching Assistance (TA)

Robot Motion Planning and Applications (CS586), KAIST School of Computing *Spring 2025*

– Lecturer: Prof. Sung-Eui Yoon

Robot Motion Planning and Applications (CS686), KAIST School of Computing *Fall 2023*

– Lecturer: Prof. Sung-Eui Yoon

Introduction to Artificial Intelligence (CS470), KAIST School of Computing *Spring 2023*

– Lecturer: Prof. Daehyung Park

Introduction to Artificial Intelligence (CS470), KAIST School of Computing *Fall 2022*

– Lecturer: Prof. Daehyung Park

Research Projects

EchoHound: Sonar-based Autonomous Navigation *Mar. 2025 – Present*

Supported by DSO National Laboratories, Singapore

Autonomous Off-Road Navigation *Jun. 2023 – Jun. 2026*

Supported by Hanwha Aerospace

Task-Optimal Motion Planning for Robots *Mar. 2020 – Feb. 2021*

Supported by Hyundai Heavy Industries

Development of Quadruped Robot System Technology *Oct. 2019 – Sep. 2024*

Supported by Agency for Defense Development (ADD)

Recognition, Action and Interaction Algorithms for Open-world Robot Service *Apr. 2023 – Dec. 2030*

Supported by StarLab funded by Ministry of Science and ICT (MSIT) via Information & communications Technology Planning & Evaluation (IITP)

Visual-Acoustic Understanding and Planning Based on Realistic Modeling *Mar. 2023 – Feb. 2027*

Supported by NRF funded by MSIT

AiA (AI in Action): Autonomous Action Planning AI Lab *Jun. 2021 – Feb. 2024*

Supported by Basic Research Laboratory (BRL) funded by MSIT via NRF

Understanding, Localization, and Planning Based on Modeling and Rendering *Mar. 2019 – Feb. 2023*

Supported by National Research Foundation of Korea (NRF) funded by MSIT

Proximity Computing and Its Applications to Autonomous Vehicles, Image Search, and 3D Printing *Mar. 2015 – Dec. 2022*

Supported by StarLab funded by MSIT via IITP

Media Coverage

Featured in KAIST Alumni News *May 2024*

Recognized for research presented at ICRA 2023, recipient of the Outstanding Planning Paper Award

Featured in KAIST 2023 Research Highlights *Jul. 2023*

Recognized for research presented at ICRA 2022, finalist for the Outstanding Navigation Paper Award

Featured in KAIST Research News *Jun. 2023*

Recognized for research presented at ICRA 2023, recipient of the Outstanding Planning Paper Award

Featured in KAIST CS Department News *Jun. 2023*

Recognized for research presented at ICRA 2023, recipient of the Outstanding Planning Paper Award

Featured in KAIST CS Department Research Highlights *Jun. 2022*

Recognized for research presented at ICRA 2022, finalist for the Outstanding Navigation Paper Award

Skills

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