Min-Sung Yoon

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

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

✉ minsung.yoon@kaist.ac.kr | 🏠 minsungyoon.github.io

"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 – Present*
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 – Present*
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 – Present*
SUPPORTED BY NATIONAL RESEARCH FOUNDATION OF KOREA (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 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