

Yoon Ji Won

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RESEARCH INTERESTS

- Dynamics-based design and control for robotic systems
- Optimization frameworks for energy-efficient motion and force control
- Mechanism design for enhanced workspace and compliant interaction

EDUCATION

Korea University, Seoul, Korea B.S. in Mechanical Engineering	Mar 2019 – Feb 2026 (Expected)
<ul style="list-style-type: none">• GPA: 3.94/4.5 (Overall), 4.03/4.5 (Major)• Relevant Coursework: Robotics (A+), Mechatronics (A+), Dynamics (A+), Microprocessor Programming (A+), Kinematics (A+), Manufacturing Processes (A+), Computer-Aided Design (A+)• Honors: Dean's List (4 semesters), Korea University Excellence Scholarship (2023-2025)	

RESEARCH EXPERIENCE

Research Assistant	Jun 2024 – Aug 2025
Korea Institute of Science and Technology (KIST), Seoul	
Robogram Lab Advisor: Dr. Yong Seok Ihn	
<ul style="list-style-type: none">• KAPEX(KIST Next-Generation Humanoid) - Arm Design<ul style="list-style-type: none">– Developed multi-metric optimization framework combining RBDL and MuJoCo to optimize shoulder joint angles, achieving 18.4% workspace expansion while minimizing joint torques and energy consumption <i>First author on research accepted for oral presentation at IROS 2025</i>– Designed and fabricated compact (45mm × 75mm) 2-DoF wrist module with 6mm ball screw mechanism, achieving high backdrivability for safe human-robot interaction	
<ul style="list-style-type: none">• Self-Driving Laboratory - Bimanual Manipulation System<ul style="list-style-type: none">– Designed novel antiparallelogram linkage shoulder mechanism with optimized link lengths, expanding bimanual workspace by 4.3% for confined space manipulation– Achieved low-inertia rolling contact motion through kinematic optimization• Microsurgical Robotic System - Real-Time Control<ul style="list-style-type: none">– Implemented C-based real-time multi-axis motor control using EtherCAT protocol(PDO)– Developed and validated synchronous control modes (PPM, CSV) on EPOS4 controllers	

PUBLICATIONS

Optimization Framework of the Shoulder Base Frame Initial Angle for Enhanced Dynamic Performance in a Humanoid Robotic Arm

Jiwon Yoon*, Sujin Lee*, Yong Seok Ihn

International Conference on Intelligent Robots and Systems (IROS), China, October 2025

Accepted for Oral Presentation (*Equal contribution)

Optimization of Shoulder Joint Frame Angles for Torque and Energy Performance Improvement in 7-DOF Humanoid Arms

Jiwon Yoon, Yong Seok Ihn

Korea Robotics Society Annual Conference (KRoC), Korea, February 2025

Excellence Undergraduate Paper Award

SELECTED PROJECTS

Electric Motor Design and Fabrication

Apr 2025 – Jul 2025

Hyundai H-Mobility Advanced Motor Project

- Designed permanent magnet synchronous motor using ANSYS Maxwell FEM analysis
- Led complete fabrication process including stator winding and powertrain integration
- Validated motor performance achieving 92% efficiency at rated load

Solar-Tracking Smart Parasol

Jun 2023 – Sep 2023

Korea University Creative Design Contest

- Designed 2-DoF solar tracking system to maximize shade coverage area throughout the day
- Fabricated functional prototype using acquired machining skills(welding, grinding)
- **Awarded 3rd Place** among 12 competing teams

TECHNICAL SKILLS

Programming: C/C++, Python, MATLAB, ROS2

Software: SolidWorks, NX, Creo, MATLAB-Simulink, MuJoCo, Isaac, LaTeX

Hardware: Arduino, Jetson Nano, EtherCAT, 3D printing

Languages: Korean (native), English (fluent)

SELECTED HONORS & AWARDS

2025 Excellence Paper Award, Korea Robotics Society Annual Conference

2025 University President's Award, Korea University Creative Challenge Program

2024 Certificate of Commendation, Gyeonggi Provincial Council

2024 Excellence Project Award, HD Hyundai Xitesolution

2023 Korea University Student Excellence Scholarship (renewable)

LEADERSHIP & SERVICE

Military Service: Republic of Korea Air Force, 10th Fighter Wing
Air Defence Artillery; Honorable discharged

Jun 2021 – Mar 2023

KUECS President (Engineering Volunteer Club), Korea University

Mar 2023 – Jun 2025

Led 80+ member club in STEM education outreach to 200+ elementary students across Seoul

- Progressed from Member → Executive → President over 2 years

• Awards: Best Club Award (Dean of Students), Gyeonggi Provincial Council Commendation

KUBA (Korea University Buddy Assistant)

Mar 2022 – Dec 2022

International Student Festival Booth Leader (Indonesia); Outstanding Volunteer