

MINJUN CHANG

📍 Atlanta, GA | ✉ minjunchang@gatech.edu | 🌐 wkdalswns0427.github.io | 🔄 wkdalswns0427 | 🌐 minjun-chang

RESEARCH PROFILE

Ph.D. student with five years of combined research and industry experience across RL-based legged locomotion, ROS 2 autonomy stacks, multi-modal perception, and embedded control for fielded hardware. Track record of carrying systems from research concept to deployed prototype, including a 137-station commercial fleet and two first-place national robotics competitions. Current work targets safe humanoid deployment and human-robot interaction in unstructured industrial environments.

EDUCATION

Georgia Institute of Technology

Atlanta, GA

Ph.D., Civil Engineering (Robotics and Intelligent Construction Automation)

Aug. 2025 – Expected 2029

Advisors: Dr. Yong K. Cho (RICAL) and Dr. Francis Baek (HARMONIC) | GPA: 3.83/4.00

- Co-advised by the RICAL and HARMONIC groups; humanoid motion control, field robotics, and human-robot interaction.

Yonsei University

Seoul, Republic of Korea

B.S., Mechanical Engineering

Mar. 2019 – Feb. 2025

TECHNICAL SKILLS

Programming	Python, C++, C, MATLAB, JavaScript
Robotics & Simulation	ROS 1/ROS 2, IsaacSim/Lab, MuJoCo, SolidWorks, motion planning, state estimation
Machine Learning	PyTorch, Reinforcement Learning, Temporal Convolutional Network, Sim-to-Sim/Real transfer
Embedded & Hardware	STM32, ESP32, Arduino, ARM Cortex-M7, Jetson, Raspberry Pi, Serial/CAN peripherals
Platforms	Unitree H1-2, Unitree Go1, Bolt 6 Biped, AgileX ScoutMini, WeGo ERP42, Mobile Manipulators
Infrastructure	Linux, Docker, Git, AWS S3, FastAPI, CUDA
Languages	Korean (Native), English (Professional), Japanese (Intermediate)

RESEARCH EXPERIENCE

Georgia Institute of Technology, RICAL and HARMONIC Labs

Atlanta, GA

Graduate Research Assistant, Advisors: Prof. Yong K. Cho and Prof. Francis Baek

Aug. 2025 – Present

- Developing motion-transfer methods that adapt human demonstrations to humanoid platforms without inheriting human kinematic constraints, targeting stable and natural whole-body motion in unstructured field environments.
- Built a real-time worker motion-recognition pipeline using temporal convolutional networks over wearable IMU streams; benchmarked three sensor-placement combinations to minimize hardware footprint without sacrificing accuracy.
- Field-validated a wearable framework combining motion recognition with zone-level localization, enabling robots to reason about human position and activity in shared workspaces.
- Contributed to a perception-to-decision vehicle monitoring system for highway work-zone safety, linking multi-modal sensing to real-time safety decisions.
- Investigated large language models as virtual personas to estimate practitioner perceptions of robotic automation, informing human-centered deployment strategy.

Dynamic Robotic Systems Laboratory (DYROS), Seoul National University

Seoul, Korea

Undergraduate Research Intern, Advisor: Prof. Jaeheung Park

June 2024 – Dec. 2024

- Trained robust reinforcement-learning locomotion policies for the Bolt10 bipedal robot in Isaac Gym (rs1-r1, CUDA 12.2), targeting real-world transfer.
- Designed a state-estimator MLP trained *concurrently* with the locomotion policy, measurably improving sim-to-sim transfer and enabling adaptive walking on terrain unseen during training.
- Executed full sim-to-sim verification from Isaac Gym to MuJoCo and characterized emergent gaits, including crouched and swing walking, under domain randomization.
- Presented results as a poster at the SNU GSCST symposium; work published at KRoC 2025.

Machine Learning and Control System Lab (MLCS), Yonsei University

Seoul, Korea

Undergraduate Research Intern, Advisor: Prof. Jongeun Choi

July 2022 – Jan. 2023

- Developed a state-prediction-based compensation scheme for control-input delay in autonomous driving, improving closed-loop tracking under actuation latency.
- Led localization for the competition vehicle that won 1st place at the Korea Robot Society Autonomous Robot Racing Competition (2022).

INDUSTRY EXPERIENCE

Hanwha Systems, Space and Defense

Satellite Software Engineer

Seoul, Korea

Jan. 2025 – May 2025

- Wrote flight-grade embedded software for a [small synthetic-aperture-radar satellite](#) payload on ARM Cortex-M7, covering scheduling and multi-protocol peripheral communication.

GoLe Robotics

Robotics Engineer, Intern

Seoul, Korea

Apr. 2024 – June 2024

- Implemented the full ROS 2 navigation stack for “WeRo”, an autonomous payload delivery robot for construction sites, built from scratch without Nav2.
- Deployed an enhanced A* global planner with a Regulated Pure Pursuit local controller, tuned for cluttered, dynamic nature of construction sites.
- Authored C++ - Python bindings for the robot controller package to give the team a fast prototyping interface over the performance-critical core.

DRIMAES

Embedded Software Engineer

Seoul, Korea

Oct. 2022 – Mar. 2024

- Built the Linux control system and OTA update service (AWS S3) for a [Battery Switch Station](#) product line **deployed across 137 stations** in the field.
- Developed STM32F103 battery-management firmware and PLC driver middleware, plus serial communication drivers for [multi-purpose Kiosk system](#).
- Containerized middleware with Docker and orchestrated multi-container deployments, cutting release friction across a heterogeneous hardware fleet.

ToysMyth (SIOT Infotech)

Embedded Software Engineer

Seoul, Korea

Feb. 2022 – Oct. 2022

- Improved timing determinism in a custom OpenWRT kernel and developed sensor drivers extending an IoT platform.

PUBLICATIONS

1. **Chang, M.**, Kim, T., Cho, Y., Baek, F. (2026). “Beyond Human Constraints: Rethinking Motion Transfer for Construction Humanoids.” *IEEE/RSJ IROS*, Workshop on the Future of Construction, Under Review.
2. Kim, T., Lee, G., **Chang, M.**, Lim, S., Choi, J. (2026). “Deployable Human Preference Alignment in Robotics: Learning Representative Rewards from Diverse Human Preferences.” *AAAI 2027*, Under Review, *arXiv:2607.12466*.
3. **Chang, M.**, Machiraju, S., Baek, F., Cho, Y. (2026). “Real-Time Temporal Convolution based Worker Motion Recognition with Three IMU Sensor Combinations.” *ISARC 2026*, Singapore.
4. **Chang, M.**, Machiraju, S., Cho, Y. (2026). “Field Evaluation of a Wearable Framework for Worker Motion Recognition and Zone-Level Localization.” *ISARC 2026*, Singapore.
5. Baek, F., **Chang, M.**, Kim, E. (2026). “Large Language Models as Virtual Personas to Estimate Construction Practitioners’ Perceptions of Robotic Automation.” *ASCE i3CE 2026*, Songdo, Korea.
6. Kim, S., **Chang, M.**, Machiraju, S., Cho, Y. (2026). “A Perception-to-Decision Vehicle Monitoring System for Highway Work-Zone Safety.” *ASCE i3CE 2026*, Songdo, Korea.
7. **Chang, M.**, Shin, J., Park, J. (2025). “Robust Symmetric Bipedal Locomotion Development via Simultaneous State Estimator Neural Network Training.” *KRoC 2025*, Jeju, Korea.
8. Nam, H.*, Choi, S.*, **Chang, M.***, Yang, J.*, Lim, J., Choi, J. (2023). “State Prediction based Control Input Delay Compensation for Autonomous Driving Systems.” *KRoC 2023*, Jeju, Korea. *equal contribution.

PATENTS AND INTELLECTUAL PROPERTY

Autonomous Driving Auxiliary Cart Robot for Assembly Process

KR 10-2024-0177135, under prosecution

Automatic-Continuous Urine Output & Urinalysis System (ACUOUS)

KR 10-2944428, registered

Eye Tuner: Media Literacy Program based on Pupil Tracking

Software copyright C-2024-039138

SELECTED AWARDS

Grand Prize (1st place), National ICT Smart Device Competition, Ministry of Science and ICT

2024

Grand Prize (1st place), Autonomous Robot Racing Competition, Korea Robot Society

2022

Excellence Prize, MEDICAL HACK (Busan City) and KU Medical Hackathon

2021, 2020

Top 8, EDISON Computer Aided Design Competition (K-MOOC)

2020