Dong-Yeop, Shin

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Education

Seoul National University *(Seoul, Korea)*   **(**2025/07 –)
- Master of College of Engineering   Cumulative **GPA** : **4.3/4.3**
  - Major : **Smart City Engineering**   Advisor : [Prof. Seong-Woo Kim]

Gachon University *(Seongnam, Korea)*   **(**2018/03 – 2024/08)
- Bachelor of Science in Mechanical Engineering   Cumulative **GPA** : **4.06/4.5**
  - Major : **Mechanical Engineering**   Advisor : [Prof. Kyoung-Su Park]
  - Minor : Computer Engineering   Graduation : August 2024

Research Interests

- **Proactive VLA** for preemptive human assistance.
- **Dynamic Perception & Memory** beyond static foundation models.
- **Adaptive Policy** evolving through physical interaction.

Research & Project Experiences

Researcher   **Seoul National University** (2024-11 –)
Robotics Researcher in : ***Autonomous Robot Intelligence Laboratory***

- **Developed** autonomous driving system
- VLA (Vision-Language-Action) Model Deployment & Evaluation
- Deployed Sim2Real RL policy for Quadruped Locomotion
- Research on Language-Conditioned Multi-Robot Systems (MRS)

Research Internship   **Gachon University** (10/2022 – 05/2024)
Robotics Researcher & Engineer in : ***Intelligent Systems & Vibration Control Laboratory***

- **Research on** improving the dynamic performance of **Mobile Cable-Driven Parallel Robots (MCDPR)**
  - Developed **On-line MCDPR geometry estimation** based on the sensor's Extended Kalman Filter processing for compensating command loss and communication delay.
  - Systematized **tracking framework for end-effector with ArUco Marker** for error compensation
  - Developed a **Hybrid force compensation cable control method** to improve the dynamic performance of MCDPR by combining PID control, Nullspace-model, and cable length control.
  - Investigated Compensation of force control hysteresis error caused by cable's elasticity in MCDPR.
  - Researched tension control stability enhancement in mobile cable-driven parallel robots using a multi-spring serial elastic actuator structure.
- Designed Timing-screw driven inversing guide system for automatic ampoule vision inspection system.

Advanced 3D printer mechanism development Projects   (05/2018 – 11/2020)
Personal Project

- Engineered a pneumatic-controlled water-cooling 3D-printer hot-swap tool-changer system. *(Video)*
  - Invented Kinematically stabilized hot-swap tool base *(Video)*
  - Designed Low inertia flexible-shaft & worm gear driven 3d-printer extruder system
- Conducted 3D printing failure(spaghetti) detection with yolo transfer learning

Technical Skills

Software Proficiency
- **CAD/CAM** : Proficient in **Solidwork**s and **Fusion 360** for 3D modeling & manufacturing.
- **Finite Element Analysis** : Skilled in **Abaqus** for static structural design validation.
- **PCB Design** : Experienced in **KiCAD** for electronic circuit fabrication.
- **Robotics Programming**: Proficient in **ROS2**(Python).
- **Simulation** : Experienced in IsaacSim , IsaacLab for configure artificial environment & simulation
- **Programming Languages** : Proficient in **Matlab**, **Python** for software development and data analysis.
- **Operating Systems** : Proficient in **Linux**(Ubuntu, Debian, CentOS, Alpine) & **Virtualization**(Proxmox, ESXi).

Hardware Experience
- **Manufacturing Tools**: Regularly utilize **laser cutter**,**CNC** machine, and **3D printer** in various projects.
- **Microcontrollers/SBCs** : Adept in using **Arduino**, **Raspberry Pi Pico**, **Raspberry Pi**, Odroid and TwinCAT(**EtherCAT)** system for embedded controller systems.

Technical Publications

Publications
- Hybrid cable tension–length compensation algorithm for dynamic performance   (04/2024) improvement of mobile cable-driven parallel robot.   *(doi : 10.1007/s00542-024-05673-4)* **Shin, DY.**, Kim, BG., Im, JH., Hong, SG., & Park, KS. (2024). Microsystem Technologies.

- Development of a smart automated sorting system based on optimal route design   (11/2022) using genetic algorithm. Seo, DW., Moon, GW., & **Shin, DY.** (2022). Korean Journal of Information Processing Society, 29(2), 910-912.

Poster & Conference Presentations
- Hybrid force compensation method for improving the dynamic performance of   (11/2023) mobile cable-driven parallel robot (MCDPR), Korean Society of Mechanical Engineers, Song-do, Incheon, Korea.

- Enhancing Tension Control Stability of Mobile Cable-Driven Parallel Robots   (04/2024) through Multi-Spring Structure, Korean Society of Mechanical Engineers, Song-do, Incheon, Korea.

Honors & Scholarships

Design Porject Awards

Project : Autoscroll Braille Device for blind (Video : [Team - Braille Library](#))
- 2023 Creative Comprehensive Design Competition   (11/2023) > Korea Industrial Technology Promotion Agency Award
- 2023 Sungkyunkwan University Consortium Creative Comprehensive Design Competition   (11/2023) > Silver Award from the Consortium Director of Healthcare
- 2023 Gachon University Creative Comprehensive Design Competition   (09/2023) > Grand Prize from the President of Gachon University

Project : Smart logistics sorting system (Video : [Team - Boxer](#))
- 2022 ICT Hanium Mentoring Contest   (12/2022) > Silver Award from the Director of the Information and Communication Planning Evaluation Institute