Hanbin **Jang**

· Robotics/Control/Planning/Learning

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Education

Seoul National University (SNU) — *Seoul, South Korea*

B.S. Major in Mechanical Engineering, Minor in Electrical & Computer Engineering — *Mar. 2019 - Feb. 2026*

North Carolina State University (NCSU) — *Raleigh, NC, US*

Exchange student in the Department of Mechanical and Aerospace Engineering — *Jan. 2025 - Aug. 2025*

Research Interests

Planning & Control	Whole-body Planning/Control, Hierarchical Architecture, Hybrid Control Methods (model-based + data-driven)
AI & ML	Deep Learning, Data-driven System Identification, Reinforcement Learning, Sim-to-Real Transfer
Systems	Legged Robots, Wearable Robots, Autonomous Systems, Nonlinear Systems
Hardware	Quadrupeds, Robotic End-effectors, Wearable Robots

Experiences

Sequor Robotics — *Seoul, South Korea*

Internship Employee — *Dec. 2025 - Now*

- Developing an anomaly detection algorithm using sensors based on Mixture Density Network and Variational Auto Encoder
- Collected and processed LiDAR and IMU datasets and evaluated model performance
- Contributed to a project selected in 2023 for Korea's *DeepTech – Tech Incubator Program for Startup (TIPS)*

Hybrid Intelligent Experimental Robotics (HIER) Lab at NCSU — *Raleigh, NC, USA*

Undergraduate Research Assistant (Advisor: Dr. Jaemin Lee) — *Jan. 2025 - Aug. 2025*

- Implemented a data-driven learning pipeline for adaptive quadrupedal locomotion on challenging terrains
- Designed a hybrid control architecture combining model-based and data-driven methods
- Developed a C++/Python API for Mujoco data acquisition and neural network training using PyTorch/TorchScript

Wearable Robotics Lab (WRL) at SNU — *Seoul, South Korea*

Undergraduate Research Assistant (Advisor: Assistant Prof. Jinsoo Kim) — *Jul. 2024 - Dec. 2024*

- Designed hardware for a soft hip-flexion exo-suit to reduce Parkinson's freezing symptoms
- Created CAD models for motor casings and tendon–pulley systems; fabricated coupling parts with load cells and fabrics
- Developed adjustable textile components for wearable comfort across diverse body sizes
- Analyzed gait patterns to design a gain-adaptive control algorithm for self-paced treadmills
- Developed IMU-based system for outdoor foot motion, speed, and path data collection

Soft Robotics and Bionics Lab (SRBL) at SNU — *Seoul, South Korea*

Undergraduate Research Assistant (Advisor: Prof. Yonglae Park) — *Jun. 2023 - Jan. 2024*

- Designed a silicone finger pad to enhance haptic perception, allowing users to sense object weight during tele-operation
- Developed a soft end-effector for fabric gripping using air-suction mechanisms

Skills

Prototyping	CAD (Solidworks, Fusion360), 3D Printing (FDM, SLA, SLS), Textile Fabrication
Programming	Python, MATLAB, C++
Simulation & Control	Mujoco, OSQP
Image Editing	Adobe Photoshop, Lightroom (technical illustration, experiment documentation)
Languages	Korean (Native), English (Fluent)
Others	Linux OS (Ubuntu), Windows OS

Honors & Awards

12/20/24 **3rd Prize at Mechatronics Contest,** Seoul National University — *Seoul, South Korea*

12/06/24 **Outstanding B.S. Thesis Presentation Award,** Seoul National University — *Seoul, South Korea*

Publications

Data-driven Whole-Body Locomotion Control: Adaptive Quadrupedal Locomotion over Multiple Terrains *(in preparation)* — *IEEE Robotics and Automation Letters*

1st Author — *Now*

- Proposed hybrid approaches combining model-based and data-driven methods for adaptive locomotion control under varying friction

Projects & Activities

Summer Symposium by Office of Undergraduate Research at NCSU — *Raleigh, NC*

Presenter for <Reactive Locomotion of Quadruped Robots over Various Terrains: Data-driven Learning for Model-based Planning and Control> — *Jul. 2025*

- Proposed a novel control architecture combining model-based and data-driven approaches

B.S. Graduation Thesis Poster Presentation Contest at SNU — *Seoul, South Korea*

Presenter for <A study on how stroke plane angle difference affects the hovering of damselfly> — *Dec. 2024*

- Analyzed the vorticity induced by the difference between fore-wing and hind-wing pairs of damselflies using CFD
- Specified that the re-attachment location of Leading Edge Vortex is important in determining aerodynamical performance

Mechatronics Contest — *Seoul, South Korea*

State Estimation Algorithm Design, Communication system construction — *Dec. 2024*

- Designed a ball tracking system using vision and 3D location estimator
- Proposed the concept of an automated referee system for commercial purpose

Service & Volunteer

Student Employee, Park's Creative Space, Dept. of Mechanical Engineering, SNU — *Seoul, South Korea*

Fabrication Equipment Manager & Instructor — *Feb. 2023 – Dec. 2024*

- Managed shared FDM/SLA/SLS 3D printers and instructed students in prototyping workflows

Volunteer, 'Kkori (Tail)' Campus Animal Welfare Club — *Goyang, South Korea*

Angel's Nest Shelter — *2022 – 2024*

- Provided care for rescued animals and led fundraising item design (postcards, eco-bags)

Republic of Korea Army — *South Korea*

Mandatory Military Service — *Sep. 2020 – Mar. 2022*

- Completed mandatory service; discharged as Sergeant

Student Mentor, P.I. (Progress for Ideal), Maecheon High School — *Daegu, South Korea*

Group Project Instructor — *2019 – 2023*

- Organized and mentored an interdisciplinary summer research camp for high school students

Scholarship

Cohort 2 Scholar, Korea-U.S. Special Exchange Program for STEM Students — *Seoul, South Korea*

Korea Institute for Advancements of Technology (KIAT) — *Nov. 2024*

- Awarded the Youth STEM Scholarships for robotics field