

# Junsung Park

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## Research Interests

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### Robotics Engineer | Learning-Based Control

I aim to **build generalizable robot autonomy capable of robust interaction in dynamic, unstructured environments**. My primary interest lies in **Robot Learning**, utilizing **Reinforcement Learning** and **Learning based Control** to ensure system robustness against uncertainty.

Ultimately, I seek to advance **Human-Robot Interaction**, focusing on humanoid robots and wearable interfaces to bridge the gap between human intent and robotic action.

## Education

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**University of California, San Diego**, La Jolla, CA, USA

Jan 2026 (Upcoming)

- Enrolled as an exchange student for Winter and Spring Quarters
- Tuition and stipend fully covered by Korea-U.S. Student Exchange Program Scholarship

**Seoul National University**, Seoul, South Korea

Mar 2020 – Feb 2026

- B.S. in Department of Electrical and Computer Engineering (Minor in Mechanical Engineering)
- **GPA: 3.87/4.0**
- Relevant Coursework: Robot Learning (Graduate, A+), Mechanical System Modeling and Control (A+), Introduction to Robotics (A+), Fundamentals of Control Engineering (A+), Mechatronics (A+)
- Tuition and stipend fully covered by Silla Scholarship Foundation
- Leave of absence for 2 years of mandatory military service in the Republic of Korea Air Force (Feb 2022 – Nov 2023)

**Daejeon Science High School for the Gifted**, Daejeon, South Korea

Mar 2017 – Feb 2020

- Graduated with Honors, Specialized Curriculum in Mathematics and Physics

## Publications

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[1] **Junsung Park**. *BiCQL-ML: A Bi-Level Conservative Q-Learning Framework for Inverse Reinforcement Learning*. arXiv preprint arXiv:2511.22210, 2025. (link)

[2] **Junsung Park**, Hogun Kee, and Songhwai Oh. *Modality-Augmented Fine-Tuning of Foundation Robot Policies for Cross-Embodiment Manipulation on GR1 and G1*. arXiv preprint arXiv:2512.01358, 2025. (link) (Working in Progress)

## Research Experience

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**Robot Learning Lab (RL LAB)**, *Research Intern* (Advisor: **Prof. Songhwai Oh**)

Jan 2025 – Present

- Pioneered **modality-augmented VLA diffusion policies** for the **Unitree G1**, creating a **multi-modal dataset** that improved manipulation success from 48% to 94% via force integration - **open-sourced the dataset on Hugging Face [Link]**, achieving over 4k downloads in the first month.
- Developed a **goal-conditioned locomotion controller** using **end-to-end PPO** with **curriculum reward shaping**, enabling stable navigation and robust heading alignment.
- Engineered a **whole-body motion retargeting** pipeline converting the OMOMO dataset to robot kinematics, facilitating large-scale **imitation learning** of human interactions.
- Implemented a **transformer-based semantic mapping** system that transforms egocentric RGB-D observations into allocentric **Bird's-Eye-View representations** for 3D spatial reasoning.

**Soft Robotics and Bionics Lab**, *Research Intern* (Advisor: **Prof. Yong Lae Park**)

June 2024 – Dec 2024

- Designed and prototyped a **wearable rehabilitation glove** integrating **Twisted String Actuators** and **e-gain soft sensor** for assisted hand motion.

- Developed and integrated motor control architecture for real-time finger strain detection, enhanced by **IMU-based feedback control** to enable adaptive and **closed-loop motion regulation**.

**Robotics Laboratory, Research Intern** (Advisor: **Prof. Frank Chongwoo Park**)

Jun 2025 – Present

- Developed and fine-tuned **vision-language-action models** by collecting demonstration data with the **Franka Emika Panda** and adapting the **Pi-0** model for real-world policy transfer.
- Developing a **physics-integrated action generation** framework that augments diffusion policies with a **Hamiltonian action encoder**, embedding **energy-conserving constraints** into the action manifold.

## Conference Presentations

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**2025 IEEE MIT URTC**, Boston, MA, USA

Oct 2025

- Poster Presentation (Peer-Reviewed Abstract): “*BiCQL-ML: A Bi-Level Conservative Q-Learning Framework for Inverse Reinforcement Learning.*”

**2025 ICCE-ASIA**, Busan, South Korea

Oct 2025

- Poster Presentation: “*BiCQL-ML: A Bi-Level Conservative Q-Learning Framework for Inverse Reinforcement Learning.*”

**2024 SRRC Workshop**, Seoul, South Korea

Feb 2025

- Design and Implementation of a TSA-Driven Opposition Assist Glove with Integrated Soft Sensors
- Presented a poster on the development of a wearable rehabilitation glove integrating rack-and-pinion actuator, e-gain soft sensor and IMU-based feedback control for adaptive hand motion assistance.

## Awards and Honors

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**Gold Prize, SNU Creative Design Fair (out of 75 teams)**

Sep 2025

- Awarded with a prize of \$1,000 and international conference support worth \$4,000
- Developed and validated a novel offline IRL reward-inference method through predictive-consistency evaluation on MuJoCo continuous-control benchmarks without online RL.

**3rd Prize, Mechatronics Design Competition (out of 25 teams)**

June 2024

- Awarded with a prize of \$500
- Recognized for developing an innovative mechatronic system integrating mechanical design and control algorithms

**Korea-U.S. Student Exchange Program Scholarship**

Nov 2025

- Recognized for excellence in intelligent robotics research; awarded \$9,000 for outstanding academic and interdisciplinary achievement in AI-driven communication and control systems.

**Semiconductor Track Scholarship**

Jan 2025 - Present

- Recognized for excellence in interdisciplinary studies; awarded \$4,300 to date, with \$10,000 to be awarded upon graduation

**Shilla Cultural Scholarship Foundation Scholarship**

Mar 2021 - Present

- Awarded full tuition coverage until graduation, recognizing academic excellence

## Extra Curricular

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**SNU BUDDY(cultural exchange organization for exchange students)**

Aug 2025 - Dec 2025

- Facilitated cultural exchange by introducing Korean culture and campus life to international exchange students

**Gongsang (SNU College of Engineering Student Reporters)**

Mar 2021 – Dec 2024

- Promoted STEM via web magazines on daily engineering, faculty insights, and engineering disciplines
- Mentored high school students and supported outreach activities at the SNU Youth Engineering Frontier Camp

## Skills

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**Languages:** Korean, English

**Technologies:** Python, C ++, MATLAB, Isaac Sim, Fusion360, Simulink, Verilog