Youngwoo Sim

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Scholar | Linkedin

R&D Experience Focus

- **Full-Scale Humanoid Development**: Electro-Mechanical Actuation Systems, Kino-Dynamics
- **Dexterous Hand Design**: (RA-L 2019 Best Paper) Human-Level Capability & Safety
- **Teloperation & Haptics**: Large-scale Haptic Human-Machine Interfaces
- **Interactive Design Optimization**: High-DoF optimal robot design software for rapid & interactive design

Education

University of Illinois at Urbana-Champaign, PhD Candidate, Mech. Sci. & Engg. 2019 – May 2025
Seoul National University, BS in Mechanical and Aerospace Engineering 2011 – 2018

Experience

Research Assistant, Robodesign Lab – UIUC, IL (Advisor: Joao Ramos) Fall 2019 - Now

- (**VID**) Optimal design of humanoid actuation system with guaranteed safe operation
- (**VID**) Development of mech. & elec. systems of a full humanoid robot and teleoperation interfaces
- (**VID**) Development full-body motion capture & haptic human-machine interface

Hardware Researcher, Skild AI – Pittsburgh, PA May 2024 – Now

- R&D of numerous teleoperation interfaces & weight-sensitve robots (HW & SW)

Research Intern, IRIM Lab – Koreatech, South Korea (Advisor: Yong-Jae Kim) Sep 2017 - Mar 2018

- (**VID**)**(RA-L 2019 Best Paper)** Development of anthropomorphic finger robot with 10x payload

Robotics Intern, NAVER LABS – Bundang, South Korea Jan 2017 - Aug 2017

- Development of mobile robot with RL-based navigation and CNN-based image processing **(ICRA 2018)**

Publications

(2024 Humanoids) Wheeled Humanoid Bilateral Teleoperation with Position-Force Control Modes for Dynamic Loco-Manipulation
(2024 IROS) Toward Control of Wheeled Humanoid Robots with Unknown Payloads: Equilibrium Point Estimation via Real-to-Sim Adaptation
(2023 ICRA) Bipedal robot walking control using human whole-body dynamic telelocomotion
(2023 Humanoids) Control-& Task-Aware Optimal Design of Actuation System for Legged Robots Using Binary Integer Linear Programming
(2023 Humanoids) Whole-body dynamic telelocomotion: A step-to-step dynamics approach to human walking reference generation
(2022 RA-L) Tello leg: The study of design principles and metrics for dynamic humanoid robots
(2021 ICRA) The dynamic effect of mechanical losses of transmissions on the equation of motion of legged robots
(2021 IROS) Hoppy: An open-source kit for education with dynamic legged robots
(2019 RA-L) Fluid lubricated dexterous finger mechanism for human-like impact absorbing capability
(2018 ICRA) Applying asynchronous deep classification networks and gaming reinforcement learning-based motion planners to mobile robots

Misc.

CAD Tools: Solidworks, Catia

Research Tools: Matlab, Python, C++, Labview, Labview FPGA
Awards: South Korea National PhD Funding (100k$), Silver medals in Korea Physics & Chemistry Olympiad