

Myungsun Park mypark@ucsd.edu

My research focuses on enhancing **adaptability and dexterity in robots during physical interaction with complex environments**. I draw inspiration from human motion, sensing, and intelligence, and embody these principles in real-world robotic systems. My recent work tackles irregular, unsteady, and contact-rich environments through **exteroceptive sensing (e.g., tactile and flow sensing) and human-robot interfaces such as motion-capture gloves that enable intuitive teleoperation and robot learning**.

Experience

2024–Present: Postdoctoral researcher (Advisor: Michael T. Tolley and Geno Pawlak)
University of California, San Diego

Education

2024: Ph.D. in Mechanical engineering (Advisor: Yong-Lae Park)
Seoul National University
2018: B.S. in Mechanical and aerospace engineering (*Summa Cum Laude*)
Seoul National University

Awards and Honors

2025: Selected for Carl Storm Opportunity Fellowship for Gordon Research Conference
2025: Selected for **Rising Stars of RoboSoft 2025**
(15 selected among assistant professors, group leaders, postdocs and students)
2025: Best poster award at the IEEE International Conference on Soft Robotics (RoboSoft)
The HARDER Workshop
2024: **Sejong Science Fellowship** (Overseas Training Track)
National Research Foundation of Korea
2024: Best poster presentation award at the SRRC Workshop
Soft Robotics Research Center, Seoul National University
2022: Selected for Elite summer school, University of southern Denmark
2020: Cover article for *Advanced Intelligent Systems*
2019: 1st Place award in wearable challenge competition
at the IEEE International Conference on Soft Robotics (RoboSoft)
2018: Graduation with honors, *Summa Cum Laude*
2014–2018: Korean national scholarships
2015–2017: SNU Mechanical engineering scholarships
2015–2017: Hyunsong educational and cultural foundation scholarships
2014: Seoul National University foundation scholarship

Publications

1. [TacO: Benchmarking Tactile Sensors for Object Manipulation](#). Anya Zorin, Zilin Si, **Myungsun Park**, Junsung Park, Alexiy Buynitsky, Sachin Bhadang, Taejun Park, Sohee John Yoon, Yong-Lae Park, Oliver Kroemer, Zeynep Temel, Michael T. Tolley, Sha Yi, Xiaolong Wang. *Under review*.
2. [Bioinspired flow sensor enables underwater robots to estimate motion and detect flow structure](#). **Myungsun Park**, Allyson E. Chen, Jacobo Cervera-Torralba, Michael T. Tolley, Geno Pawlak. *Under revision*.
3. [Dynamic shape control of soft robots enabled by data-driven model reduction](#). Iman Adibnazari, Harsh Sharma, **Myungsun Park**, Jacobo Cervera-Torralba, Boris Kramer, Michael T. Tolley. *Under review*.
4. [Analysis of kinematics and propulsion of a self-sensing multi-dof undulating soft robotic fish](#). **Myungsun Park**, Jacobo Cervera-Torralba, Iman Adibnazari, Geno Pawlak, Michael T. Tolley. *IEEE International Conference on Robotics and Automation (ICRA)*. 2025.
5. [Real-time Estimator of Actuator Control and Health \(REACH\) on an Eel-Inspired Soft Robot](#). Zhangjingyi Jiang, **Myungsun Park**, Michael T. Tolley, Mark Campbell. *IEEE International Conference on Soft Robotics (RoboSoft)*. 2025.
6. [Stretchable glove for accurate and robust hand pose reconstruction based on comprehensive motion data](#). **Myungsun Park**, Taejun Park (co-1st author), Soah Park, Sohee John Yoon, Sumin Helen Koo, Yong-Lae Park. ***Nature Communications***. 2024.
7. [Teleoperation of Soft Robots with Real-Time Fingertip Haptic Feedback Using Small Batteries](#). Hyeonseong Ham, **Myungsun Park (co-1st author)**, Taejun Park, Xuelang Gao, Yong-Lae Park, Moon Jeong Park. ***Advanced Materials Technologies***. 2023.
8. [Parametric analysis of multi-material soft sensor structures for enhanced strain sensitivity](#). **Myungsun Park**, Taejun Park, Yong-Lae Park. ***Extreme Mechanics Letters***. 2023.
9. [Selectively stiffening garments enabled by cellular composites](#). Junghan Kwon, Inrak Choi, **Myungsun Park**, Jeongin Moon, Bomin Jeong, Prabhat Pathak, Joeeun Ahn, Yong-Lae Park. ***Advanced Materials Technologies***. 2022.
10. [Pop-up cookie molds: self-folding elastomer sheets using thermal expansion of embedded air chambers](#). Junghan Kwon, **Myungsun Park**, Jaeyoun Choi, Yong-Lae Park. ***Smart Materials and Structures***. 2021.
11. [Probabilistic modeling and Bayesian filtering for improved state estimation for soft robots](#). DongWook Kim, **Myungsun Park**, Yong-Lae Park. ***IEEE Transactions on Robotics***. 2021.
12. [Hybrid system analysis and control of a soft robotic gripper with embedded proprioceptive sensing for enhanced gripping performance](#). **Myungsun Park**, Bomin Jeong, Yong-Lae Park. ***Advanced Intelligent Systems***. 2021. ***Cover article***.
13. [Optically sensorized elastomer air chamber for proprioceptive sensing of soft pneumatic actuators](#). Jaewoong Jung, **Myungsun Park (co-1st author)**, DongWook Kim, Yong-Lae Park. ***IEEE Robotics and Automation Letters***. 2020.
14. [Multi-material soft strain sensors with high gauge factors for proprioceptive sensing of soft bending actuators](#). **Myungsun Park**, Yunsik Ohm, DongWook Kim, Yong-Lae Park. *IEEE International Conference on Soft Robotics (RoboSoft)*. 2019.

Teaching, Mentoring, and Service

- **Conference session chair:** International Conference on Robotics and Automation (ICRA), Atlanta, GA USA. (5/21/2025)
- **Guest lectures:** UC San Diego MAE 249: Soft Robotics (5/15/2024, 11/19/2024, 11/11/2025)
- **Project evaluation:** UC San Diego MAE 156B: Senior mechanical engineering student design projects (11/21/2024, 3/19/2025, 6/10/2025)
- **Conference volunteer:** IEEE International Conference on Soft Robotics (RoboSoft) San Diego, CA USA (4/14-17, 2024).
- **Teaching Assistant:** SNU M2794.001700: Mechanical product design (2019)
- **Mentoring:** Nadjila Sediki (MAE), Anu Fnu (CS), Yushan Xian (EE)
- **Tutoring:** SNU Peer tutoring program (math, physics), 18 freshmen/international students (2015–2018)
- **Team leader:** SNU student club for off-road car racing (KSAE Baja) (2015–2017)

Patents

1. [Variable Stiffness Structure with Sandwich Structure](#). Yong-Lae Park, Junghan Kwon, Inrak Choi, Myungsun Park, Bomin Jeong. Korean Patent No. 1026586640000 (2024/04/15).
2. [Forming Mold](#). Junghan Kwon, Yong-Lae Park, Myungsun Park, Jaeyoun Choi. Korean Patent No. 1027893080000 (2025/03/26).
3. [Optical Sensing Actuator, Soft Robot Having The Same Manufacturing Methods of Optical Sensing Actuator](#). Yong-Lae Park, Jaewoong Jung, Myungsun Park. Korean Patent No. 1022759000000 (2021/07/05).

Filed

1. **Flow sensor for underwater robots.** Myungsun Park, Geno Pawlak, Michael T. Tolley. US Provisional Patent. Serial number 63/912,066 (2025/11/5).
2. [Soft Sensing Glove](#). Yong Lae Park, Myungsun Park, Taejun Park, Sohee Yoon. US Patent Application No. 19/224,848 (2025/6/1).
3. [Soft Sensing Glove](#). Yong Lae Park, Myungsun Park, Taejun Park, Sohee Yoon. Korean Patent Application No. 10-2025-0015203 (2025/2/6).
4. **Sensor-Integrated Actuator, and Haptic Feedback System Using Same.** Moon Jeong Park, Yong-Lae Park, Myungsun Park, Hyeon Seong Ham. China Patent Application No. 202410332777.1 (2024/3/22).
5. [Sensor-Integrated Actuator, and Haptic Feedback System Using Same](#). Moon Jeong Park, Yong-Lae Park, Myungsun Park, Hyeon Seong Ham. Moon Jeong Park, Yong-Lae Park, Myungsun Park, Hyeon Seong Ham. US Patent Application No. 18/612,259 (2024/03/21).
6. [Sensor-Integrated Actuator, and Haptic Feedback System Using Same](#). Moon Jeong Park, Yong-Lae Park, Myungsun Park, Hyeon Seong Ham. Korean Patent Application No. 1020240038697 (2024/03/20).

Research experiences (related publications)

1. Tactile sensing for imitation learning of fin-ray grippers in tasks involving slip, sliding, and impact (1)
2. Multi-modal flow sensing for measuring directional velocity and vibration (2)
3. Wearable motion-tracking glove capable of measuring finger abduction and distinguishing morphological variations across individuals (6,8,14)
4. Planning, control, and teleoperation of robotic hands and grippers using tactile and proprioceptive sensing with haptic feedback (7,11,12,13)
5. Development of novel sensing and actuation technologies, including liquid metal, magnetic, optical, pneumatic, and hydraulic systems (1–14)
6. Vacuum-driven variable-stiffness structure for compliance and impact resistance (9)
7. Bioinspired underwater sensing and locomotion (2,3,4,5)