SUDONG LEE

Google Scholar ⋄ LinkedIn
ORCID: 0000-0002-8928-6070

EDUCATION

Ph.D. student in Robotics, Control, and Intelligent Systems (EDRS)   2023.04. - present
EPFL (Swiss Federal Institute of Technology in Lausanne)   *Lausanne, Switzerland.*
Advisor: Prof. Josie Hughes

M.S. in Mechanical Engineering   2019.03. - 2021.08.
Seoul National University   *Seoul, Korea.*
Advisor: Prof. Yong-Lae Park

Thesis: Modularized Robotic Skin Sensorized by Fiber Optic Force Sensing
for Remote and Autonomous Robot Operation [Link]

B.S. in Mechanical Engineering   2013.03. - 2019.02.
Korea University   *Seoul, Korea.*

RESEARCH EXPERIENCE

Computational Robot Design & Fabrication Laboratory (CREATE Lab)
- EPFL (École Polytechnique Fédérale de Lausanne)   *Lausanne, Switzerland.*
Assistant-doctorant   2023.04. - present

Soft Robotics Research Center (SRRC)
- Seoul National University   *Seoul, Korea.*
Research Associate   2022.09. - 2023.03.
Research Assistant   2021.09. - 2022.08.

Research topics:
· Fiber Jamming Actuator driven by Tendons to Enhance Adaptability
· Robotic Skin using 3-DoFs Force Sensor for Dexterous and Safe Interaction

Soft Robotics and Bionics Laboratory (SRBL)
- Mechanical Engineering, Seoul National University   *Seoul, Korea.*
Graduate Student Researcher   2019.01. - 2021.08.

Research topics:
· Robotic Skin Sensorized by Fiber Optic Strain Sensors
· Multi-modal Locomotion and Environmental Adaptability of Legged Robots
· Soft Electronics and Sensors using Stretchable Materials and Sensing Mechanisms

HONORS AND AWARDS

M.S. Thesis Presentation Award   2021.06.
Mechanical Engineering, Seoul National University

Third Place Award for Locomotion Challenge   2019.04.
IEEE International Conference on Soft Robotics 2019 (RoboSoft 2019)
Team SRBL (Sudong Lee, G. Shin, J. Kim, M. Choi, Y. Baek, and Y.-L. Park)

Great Honor, Winter 2018 Graduation   2019. 02.
Korea University

Semester High Honors 1st Semester, 2013.,
Korea University 2nd Semester, 2013.,
        1st Semester, 2014.,
        2nd Semester, 2014.,
        1st Semester, 2015.,

SCHOLARSHIPS

Kwanjeong Fellowship
Kwanjeong Educational Foundation

1st Semester, 2019.,
2nd Semester, 2019.,
1st Semester, 2020.,
2nd Semester, 2020.

National Science and Engineering Scholarship
Korea Student Aid Foundation

1st Semester, 2015.,
2nd Semester, 2017.,
1st Semester, 2018.,
2nd Semester, 2018.

Academic Excellence Scholarship
Korea University

2nd Semester, 2014.

Best Honor Scholarship
Korea University

1st Semester, 2014.

PUBLICATIONS

Journal Papers

1. T. Kim, **Sudong Lee**, T. Hong, G. Shin, T. Kim, and Y.-L. Park, "Heterogeneous sensing in a multifunctional soft sensor for human-robot interfaces," *Science Robotics*, Vol. 5, No. 49, eabc6878, 2020. *(DOI: 10.1126/scirobotics.abc6878)*

2. G. Shin*, **Sudong Lee***, and Y.-L. Park, "Selective patterning of conductive elastomers embedded with silver powders and carbon nanotubes for stretchable electronics," *IEEE Robotics and Automation Letters*, vol. 7, no. 2, pp. 4983-4990, 2022. *(DOI: 10.1109/LRA.2022.3153707)*
   ***: Sudong Lee and G. Shin are co-first authors.**

3. Y. Lee, S. Lim, W. J. Song, **Sudong Lee**, S. J. Yoon, J.-M. Park, M.-G. Lee, Y.-L. Park, and J.-Y. Sun, "Triboresistive touch sensing: grid-free touch-point recognition based on monolayered ionic power generators," *Advanced Materials*, vol. 34, no. 19, 2108586, 2022.
   (DOI: 10.1002/adma.202108586)

4. T. Kim*, **Sudong Lee***, S. Chang, S. Hwang, and Y.-L. Park, "Environmental adaptability of legged robots with cutaneous inflation and sensation," *Advanced Intelligent Systems*, 2300172, 2023. (*DOI: 10.1002/aisy.202300172*)
   ***: Sudong Lee and T. Kim are co-first authors.**
   Cover Article: 10.1002/aisy.202370050, Editor's Choice: [Link]

5. J. Kang*, **Sudong Lee***, and Y.-L. Park, "Soft bending actuator with fiber-jamming variable stiffness and fiber-optic proprioception," *IEEE Robotics and Automation Letters*, vol. 8, no. 11, pp. 7344-7351, 2023. *(DOI: 10.1109/LRA.2023.3316075)*
   ***: Sudong Lee and J. Kang are co-first authors.**

6. D. Kim, **Sudong Lee**, T. H. Hong, and Y.-L. Park, "Exploration-based model learning with self-attention for risk-sensitive robot control," *npj Robotics*, vol. 1, no. 7, 2023. *(DOI: 10.1038/s44182-023-00006-5)*

7. **Sudong Lee***, J. I. Kim*, Y. Baek, D. Chang, J. Lee, Y. S. Park, D. Lee, and Y.-L. Park, "Modularized robotic skin sensorized by fiber optic force sensing for remote and autonomous robot operation." *(Under review, Submitted to IEEE Transactions on Robotics.)*
   ***: Sudong Lee and J. I. Kim are co-first authors.**

Conference Papers and Posters

1. G. Shin*, **Sudong Lee***, and Y.-L. Park, "Selective patterning of conductive elastomers embedded with silver powders and carbon nanotubes for stretchable electronics," *IEEE International Conference*

on Soft Robotics 2022 (Robosoft 2022).
**: Sudong Lee and G. Shin are co-first authors.*

2. S. Koh*, **Sudong Lee***, and Y.-L. Park, "Multi-functional tactile sensors using a hybrid structure of soft and rigid layers for adaptable interactions of robots," *(Submitted to IEEE International Conference on Robotics and Automation 2024 (ICRA 2024)).*
   **: Sudong Lee and S. Koh are co-first authors.*

3. **Sudong Lee** and J. Hughes, "Morphological and material programability of hall-effect based soft tactile sensors," *(Submitted to IEEE International Conference on Soft Robotics 2024 (Robosoft 2024)).*

PATENTS

1. J. I. Kim, **Sudong Lee**, Y. Baek, and Y.-L. Park, "Modularized Robotic Skin," 2020.
   (Korea Appl. No.: 10-2020-0148802)

2. T. Kim, **Sudong Lee**, and Y.-L. Park, "Soft Sensor with Multi-Sensing Function," 2022.
   (Korea Patent: 10-2384623)

TEACHING EXPERIENCE

M2794.001700_001: Mechanical Product Design 1st Semester, 2019.
- Mechanical Engineering, Seoul National University
Teaching assistant, Instructor: Prof. Yong-Lae Park.

ACADEMIC SERVICE

Reviewer - Journal Papers
 IEEE Robotics and Automation Letters (RA-L)
 Soft Robotics

Reviewer - Conference Paper
 IEEE/RSJ International Conference on Intelligent Robots and Systems (IROS)

TECHNICAL STRENGTHS (SKILLS)

Programming Languages	C++, Python, Matlab
Embedded System	Arduino, AVR ATmega, Single-Board Computer (SBC)
Software for System and Robots	ROS, Pybullet
Machine Learning	Pytorch, TensorFlow
Design and Simulation	3D Computer-Aided Design (CAD),
	Finite Element Analysis (FEA) Software
Fabrication	3D Printing (Additive Manufacturing), Silicone Fabrication

OTHER EXPERIENCE

Republic of Korea Air Force (ROKAF, Military Service)   2015.08. - 2017.08.
Staff Sergeant, Honorable discharge.