Seongheon Hong

E-mail: wbfprp@snu.ac.kr | Website: https://seongheonhong.github.io

EDUCATION

Seoul National University **Feb. 2016 – Feb. 2023 (Expected)**

B.S. in Naval Architecture and Ocean Engineering, Mechanical Engineering (Double Major)

(*Mandatory Military Service at Bundang Fire Station during 2019 –2020*)

PUBLICATIONS

Peer-reviewed Journals

Y. G. Kim, J. H. Song, **S. Hong**, and S. H. Ahn, "**Piezoelectric Strain Sensor with High Sensitivity and High Stretchability Based on Kirigami Design Cutting**," *npj Flexible Electronics*, 6(1), 1-8. 2022. (IF: 12.042)

Y. G. Kim*, **S. Hong***, B. Hwang, S. H. Ahn, and J. H. Song, "**Improved Performance of Stretchable Piezoelectric Energy Harvester Based on Stress Rearrangement**," *Scientific Reports*, 12(1), 1-11. 2022.
(* indicates co-first authors.)

J. H. Song, Y. G. Kim, Y. Cho, **S. Hong**, J. Y. Choi, M. S. Kim, and S. H. Ahn, "**Stretchable Strain and Strain Rate Sensor Using Kirigami-Cut PVDF Film**," *Advanced Materials Technologies* (**Accepted**)

Presentations

J. H. Song, Y. G. Kim, Y. Cho, **S. Hong**, J. Y. Choi, and S. H. Ahn, "**Sensing Performance of Stretchable Piezoelectric Strain Sensor Using Kirigami-Cut PVDF Film**," International Conference on Advanced Electromaterials, Nov. 9-12, 2021, Jeju, Korea (Oral Presentation)

PATENTS

Y. G. Kim, S. H. Ahn, **S. Hong**, "**Strain Sensor Using Piezo Film with Incision Shape**," KR-Application No. 10-2022-0065292

RESEARCH EXPERIENCE

Undergraduate Researcher

Innovative Design & Integrated Manufacturing Lab (IDIM), Seoul National University Feb. 2021 – May. 2022
(Advisor: Prof. Sung-Hoon Ahn)

- Developed wearable and tunable piezoelectric strain sensor applying kirigami-cut designs to PVDF film
- Developed the enhanced stretchable piezoelectric energy harvester using topological and thermal depolarization
- Developed piezoelectric output simulator to deformation, based on piezoelectric coefficient(e_{ij})-strain curve of kirigami-cut PVDF film.
- Devised and fabricated wearable applications – glove: VR piano, smart lens, wrist motion detector

Biorobotics Lab, Seoul National University Jan. 2022 –
(Advisor: Prof. Kyu-Jin Cho)

- Designed a size-adaptable hand orthotic glove for hypertonia patients and optimized using the human-in-the-loop approach
- Designed stiffness profile generating pulley using variable radius helix and constant torque spring

Independent Study

Softrobotics Lab, Seoul National University — Mar. 2022 –
(Advisor: Prof. Yong-Lae Park)

- Devised locomotion mechanism based on grappling hooks with monkey-inspired swinging motion for more efficient robot movement in challenging environments
- Permitted as the only team to take the course UIS 2, university-wide

HONORS AND AWARDS

Gold Award, National X-Corps Plus Festival, Korean Ministry of Science and ICT — Nov. 2022

- National level competition, participated as one of 5 university representatives
- Topic: Development of Berthing and Unberthing Algorithm for Autonomous Surface Vehicle

1st prize, Korean Autonomous Surface Vehicle Competition, The Society of Naval Architects of Korea — Aug. 2022

- Also won the best design award for boat resistance and propulsion

1st prize, AI Service Robot Competition, 7th Robot Convergence Festival — Aug. 2018

- Gutea: an autonomous mobile robot integrated with object detection and speech recognition & synthesis

Best Project Award (M2794.001800: Materials and Manufacturing Process, Instructor: Prof. S.H. Ahn) — Dec. 2018

- Project: Auto-Shading Electrochromic Helmet Visor

The National Scholarship for Science and Engineering, Korean Student Aid Foundation — Mar. 2018 – Dec. 2021

- Full tuition for 4 semesters

Academic Excellent Scholarship, Seoul National University — Sep. 2016 – Dec. 2017

- Full tuition for 3 semesters

SKILLS

Programming: C/C++, Python, MATLAB, Java (Android), LabVIEW, Max/MSP, PyTorch, ROS

Embedded: 8051, nrf52, STM32, Platform IO, Arduino

Design/Simulation: Solidworks, CATIA, OrCAD, EasyEDA, Ansys, COMSOL

Fabrication: CNC Machining, 3D Printing, Molding, Lathe, CO2/I-line Laser, E-beam Evaporator

MENTORING EXPERIENCE

Basic Physics 1 — Mar. 2018 – Dec. 2018

College Writing 2: Writing in Science & Technology — Mar. 2021 – Jun. 2021

- Mentored foreign students on writing in science & technology

Structural Dynamics — Sep. 2021 – Dec. 2021

PERSONAL EXPERIENCE

Mandatory Military Service - Government Issued Firefighter (GIFF) — Mar. 2019 – Dec. 2020

- Ranked 1st out of 152 new GIFFs, National Fire Service Academy
- Responded to 100+ Fire/Rescue & 200+ EMS Calls