

Curriculum Vitae



JISEOK KIM Ph. D

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RESEARCH INTERESTS

- Energy Harvesting Based on Triboelectric Nanogenerators (TENGs)
- Droplet electricity generator (DEG)
- Surface treatment methods for superhydrophobicity and high roughness
- Structural Dynamics and Multibody Dynamics
- Mechanical Energy Conversion Systems
- Auxetic Porous Materials (Vibration Dampers, Sound Absorbers)

EDUCATION

Ph.D. in Department of Mechanical Engineering,

Korea Advanced Institute of Science and Technology (KAIST), 03/2020 - 02/2025

Advisor: Prof. Il-kwon Oh

Thesis: Studies on energy conversion devices for harvesting low-frequency mechanical energy

M.S. in Department of Mechanical Engineering,

Korea Advanced Institute of Science and Technology (KAIST), 03/2018 - 02/2020

Advisor: Prof. Il-kwon Oh

Thesis: Double porous auxetic materials for enhancing shock/sound absorption properties

B.S. in Mechanical Engineering,

Hanyang University, 02/2013 - 02/2018

RESEARCH EXPERIENCE

Visiting Scholar

Georgia Institute of Technology (PI: *Prof. Woon-Hong Yeo*), Atlanta, USA, 08/2022 - 02/2023

Postdoctoral Researcher

Department of Mechanical Engineering, KAIST (PI: *Prof. Il-Kwon Oh*), 02/2025 - 08/2025

INTERNATIONAL & DOMESTIC PUBLICATIONS



1. Zhaoyang Sun, Xian Wen, Ji-Seok Kim, Kaiying Zhao, Qun Zhou, Manmatha Mahato, Van Hiep Nguyen, Yang Yang, Liming Wang, Il-Kwon Oh*, “Moisture-Driven Hydrogel Power Source with Asymmetric Ion Adsorption for Flexible Electronics”, *Advanced Functional Materials*(IF=19.0), v.36, no.7, e18814, 2026.01 (Selected as Back cover image)
2. Manmatha Mahato§, Jaehwan Kim§, Myung-Joon Lee, Seongjun Jo, Gwonmin Kim, Sanghee Nam, Ji-Seok Kim, Van Hiep Nguyen, Mousumi Garai, Hyunjoon Yoo, Daniel Saatchi, Zakir Ullah, Chi Won Ahn, Yury Gogotsi*, Il-Kwon Oh*, “Heteronanoarchitecture of $Ti_3C_2T_x$ MXene and Amorphous MOF for Exceptional Durability in Electro-Ionic Soft Actuator”, *Advanced Materials*(IF=27.4), v.37, no.34, 2500479, 2025.08
3. Manmatha Mahato, Sanghee Nam, Geetha Valurouthu, Hyunjoon Yoo, Mousumi Garai, Ji-Seok Kim, Woong Oh, Jawon Ha, Vipin Kumar, Chi Won Ahn*, Yury Gogotsi*, and Il-Kwon Oh* ,“Molecular Engineering of MXene-Covalent-Triazine Framework Interfaces for Electrochemical Actuators”, *ACS Nano*(IF=16.0), v.19, no.28, pp.25757-25769, 2025.07
4. Bernd Wicklein*, Hyunjoon Yoo, Geetha Valurouthu, Ji-Seok Kim, Mannan Khan, Manmatha Mahato, Federico Carosio, Yury Gogotsi, and Il-Kwon Oh*, “Multifunctional $Ti_3C_2T_x$ -alginate foams for energy harvesting and fire warning”, *Nanoscale Horizons*(IF=6.6), v. 10, no. 6, 1084-1095, 2025.04
5. Yeongju Jung, Jiyong Ahn, Ji-Seok Kim, Junhyuk Bang, Minwoo Kim, Seongmin Jeong, Jinwoo Lee, Seonggeun Han, Il-Kwon Oh, Seung Hwan Ko*. “All Weather-Usable

Wearable Dual Energy Harvester for Outdoor Sustainable Operation”, *SusMat*(IF=18.7), v.5, no.1, e264, 2025.02.

6. Araz Rajabi-Abhari, Hyunjoon Yoo, **Ji-Seok Kim**, Hong Yeon Yoon, Jeong Young Park, Nin Yan, Rassoul Tabassian*, Il-Kwon Oh*, “Reversibly Compressible Silanated Cellulose Nanofibril Aerogel for Triboelectric Taekwondo Scoring Sensors”, *Small*(IF=13.0), v. 20, no. 50, 2405664, 2024.10.
7. Yeongju Jung, **Ji-Seok Kim**, Junhyuk Bang, Seok Hwan Choi, Kangkyu Kwon, Min Jae Lee, Il-Kwon Oh, Jaemang Song, Jinwoo Lee*, Seung Hwan Ko*, “Energy-saving window for versatile multimode of radiative cooling, energy harvesting, and defrosting functionalities”, *Nano Energy* (IF=16.8), v.129, Part A, 110004, 2024.10.
8. Daniel Saatchi, Saewoong Oh, Hyunjoon Yoo, **Ji-Seok Kim**, Myung-Joon Lee, Mannan Khan, Bernd Wicklein, Manmatha Mahato, Il-Kwon Oh*, “Dynamic Schwarz Meta-Foams: Customizable Solutions for Environmental Noise Reduction”, *Advanced Science* (IF=14.3), v. 11, no. 33, 2402872, 2024.07.
9. **(Co-first author)** Kibae Lee§, **Ji-Seok Kim**§, Saewoong Oh, Hyunjoon Yoo, Jongkil Lee, Il-Kwon Oh*, and Chong Hyun Lee*, “DC Power Boosting Circuit for Freestanding-Sliding Triboelectric Nanogenerators with High Intrinsic Impedance and Multi-Harmonic Output”, *Advanced Materials Technologies* (IF=6.4), v.9, no.17, 2400225, 2024.09.
10. Ashhad Kamal Taseer§, Saewoong Oh§, **Ji-Seok Kim**, Mousumi Garai, Hyunjoon Yoo, Van Hiep Nguyen, Yang Yang, Mannan Khan, Manmatha Mahato*, Il-kwon Oh*, “Cobalt MOF-Based Porous Carbonaceous Spheres for Multimodal Soft Actuator Exhibiting Intricate Biomimetic Motions”, *Advanced Materials* (IF=27.4), v. 36, no. 26, 2312340, 2024.06
11. Hyunjoon Yoo, Manmatha Mahato, **Ji-Seok Kim**, Saewoong Oh, Mousumi Garai, Van Hiep Nguyen, Ashhad Kamal Taseer, Myung-Joon Lee, Il-Kwon Oh*, “Janus CoMOF-SEBS Membrane for Bifunctional Dielectric Layer in Triboelectric Nanogenerators”, *Advanced Science* (IF=14.3), v. 11, no. 14, 2307656, 2024.04.
12. Bernd Wicklein*, Geetha Valurouthu, HongYeon Yoon, Hyunjoon Yoo, Sathiyathan Ponnann, Manmatha Mahato, **Ji-Seok Kim**, Syed Sheraz Ali, Jeong Young Park, Yury Gogotsi, and Il-Kwon Oh*, “Influence of MXene Composition on Triboelectricity of MXene-Alginate Nanocomposites”, *ACS Applied Materials & Interfaces* (IF=8.3), v. 16, no. 18, pp. 23948-23959, 2024.04.
13. Ponnann Sathiyathan, Daniel Saatchi, Yeonju Boo, Manmatha Mahato, Bernd Wicklein, **Ji-Seok Kim**, Hyunjoon Yoo, Tae-Eun Song, Ashhad Kamal Taseer, Won Jong Kim, Il-Kwon Oh*, “Nitrogen and Sulfur Rich Covalent Organic Framework-Chitosan Triboelectric Nanogenerator for Disposable Urination Evaluation Tool”, *Advanced Materials Technologies* (IF=6.8), v. 9, no. 4, 2301883, 2024.02.
14. Saewoong Oh, Tae-Eun Song, Manmatha Mahato, **Ji-Seok Kim**, Hyunjoon Yoo, Myung-Joon Lee, Mannan Khan, Woon-Hong Yeo, Il-Kwon Oh*, “Easy-To-Wear Auxetic SMA Knot-Architecture for Spatiotemporal and Multimodal Haptic Feedbacks”, *Advanced Materials* (IF=32.086), v. 35, no. 47, 2304442, 2023.11. **(Selected as front cover image)**

15. Dongwhi Choi, Younghoon Lee, Zong-Hong Lin, Sumin Cho, Miso Kim, Chi Kit Ao, Siowling Soh, Changwan Sohn, Chang Kyu Jeong, Jeongwan Lee, Minbaek Lee, Seungah Lee, Jungho Ryu, Parag Parashar, Yujang Cho, Jaewan Ahn, Il-Doo Kim, Feng Jiang, Pooi See Lee, Gaurav Khandelwal, Sang-Jae Kim, Hyun Soo Kim, Hyun-Cheol Song, Minje Kim, Junghyo Nah, Wook Kim, Habtamu Gebeyehu Menge, Yong Tae Park, Wei Xu, Jianhua Hao, Hyosik Park, Ju-Hyuck Lee, Dong-Min Lee, Sang-Woo Kim, Ji Young Park, Haixia Zhang, Yunlong Zi, Ru Guo, Jia Cheng, Ze Yang, Yannan Xie, Sangmin Lee, Jihoon Chung, Il-Kwon Oh, **Ji-Seok Kim**, Tinghai Cheng, Qi Gao, Gang Cheng, Guangqin Gu, Minseob Shim, Jeehoon Jung, Changwoo Yun, Chi Zhang, Guoxu Liu, Yufeng Chen, Suhan Kim, Xiangyu Chen, Jun Hu, Xiong Pu, Zi Hao Guo, Xudong Wang, Jun Chen, Xiao Xiao, Xing Xie, Mourin Jarin, Hulin Zhang, YingChih Lai^{48,49,50}, Tianyiyi He, Hakjeong Kim, Inkyu Park, Junseong Ahn, Nghia Dinh Huynh, Ya Yang, Zhong Lin Wang*, Jeong Min Baik*, and Dukhyun Choi*, “Recent Advances in Triboelectric Nanogenerators: from Technological Progress to commercial Applications”, *ACS Nano* (IF=18.027), v. 17, no. 12, pp. 11087-11219, 2023.05.
16. **Ji-Seok Kim**, Manmatha Mahato, Jung-Hwan Oh*, and Il-Kwon Oh*, “Multi-Purpose Auxetic Foam with Honeycomb Concave Micropattern for Sound and Shock Energy Absorbers”, *Advanced Materials Interfaces* (IF=6.389), v. 10, 2202092, 2022.12.
17. Manmatha Mahato§, Won-Jun Hwang§, Rassoul Tabassian, Saewoong Oh, Van Hiep Nguyen, Sanghee Nam, **Ji-Seok Kim**, Hyunjoon Yoo, Ashhad Kamal Taseer, Myoung-Joon Lee, Huapeng Zhang, Tae-Eun Song, and Il-Kwon Oh*, “A Dual-Responsive Magnetoactive and Electro-Ionic Soft Actuator Derived from a Nickel-Based Metal-Organic Framework”, *Advanced Materials* (IF=32.086), v.34, no.35, 2203613, 2022. 09. (Selected as inside front cover image)
18. (Co-first author) Junseong Ahn§, **Ji-Seok Kim§**, Yoonsang Jeong, Soonhyoung Hwang, Hyunjoon Yoo, Yongrok Jeong, Jimin Gu, Manmatha Mahato, Jiwoo Ko, Sohee Jeon, Ji-Hwan Ha, Hee-Seon Seo, Jungrak Choi, Mingu Kang, Chankyu Han, Yohan Cho, Chong Hyun Lee, Jun-Ho Jeong*, Il-Kwon Oh*, and Inkyu Park*, “All-Recyclable Triboelectric Nanogenerator for Sustainable Ocean Monitoring Systems”, *Advanced Energy Materials* (IF=29.698), v.12, no.30, 2201341, 2022. 08. (Selected as back cover image)
19. Young Jung§, Junseong Ahn§, **Ji-Seok Kim**, Ji-Hwan Ha, Jaehwan Shim, Hanchul Cho, Yong Suk Oh, Yong-Jin Yoon, Youngsuk Nam, Il-Kwon Oh, Jun-Ho Jeong*, and Inkyu Park*, “Spherical Micro Nano Hierarchical Structures for Energy and Water Harvesting Devices”, *Small Methods* (IF=14.188), v.6, no.7, 2200248, 2022. 07. (Selected as inside front cover image)
20. **Ji-Seok Kim§**, Junyoung Kim§, Jong-Nam Kim, Junseong Ahn, Jun-Ho Jung, Inkyu Park, Daegyoun Kim*, and Il-Kwon Oh*, “Collectively Exhaustive Hybrid Triboelectric Nanogenerator Based on Flow-Induced Impacting-Sliding Cylinder for Ocean Energy Harvesting”, *Advanced Energy Materials* (IF=29.698), v.12, no.3, 2103076, 2022. 01. (Selected as inside front cover image)
21. Manmatha Mahato§, Jong-Nam Kim§, Rassoul Tabassian, Araz Rajabi-Abhari, **Ji-Seok Kim**, Sanghee Nam, Hyunjoon Yoo and Il-Kwon Oh*, “Mutually Exclusive Ytterbium and Nitrogen Co-Doping of Mesoporous Titania-Carbon for Self-Cleanable and Sustainable Triboelectric Nanogenerators”, *Nano Energy* (IF=17.881), v.90,

pp.106615, 2021. 12.

22. Kwan-Woo Han[§], Jong-Nam Kim[§], Araz Rajabi-Abhari, Van-Tien Bui, **Ji-Seok Kim**, Dukhyun Choi*, and Il-Kwon Oh*, “Long-Lasting and Steady Triboelectric Energy Harvesting from Low-Frequency Irregular Motions Using Escapement Mechanism”, *Advanced Energy Materials* (IF=29.368), v.11, no.4, 2002929, 2021. 01. (Selected as front cover image)
23. Jung-Hwan Oh, **Ji-Seok Kim**, Van Hiep Nguyen, and Il-Kwon Oh*, “Auxetic Graphene-Porous Foam for Acoustic Wave and Shock Energy Dissipation”, *Composites Part B: Engineering* (IF=9.078), v.186, no.1, pp.107817, 2020. 04.

INTERNATIONAL & DOMESTIC CONFERENCES

* Corresponding Author

1. [Invited - Oral] **Ji-Seok Kim***, “Development of Mechanical Energy Conversion Device for Sustainable Energy Supply”, Korea Society of Mechanical Engineering (KSME), High1 Resort, Gangwon, Rep. of Korea, 2025.12.10-13
2. [Domestic - Oral] **Ji-Seok Kim***, “Design of mechanical energy conversion devices by using dynamic energy at low-frequencies”, The Korean Society for Noise and Vibration Engineering (KSNVE), Lahan Select Gyeongju, Gyeongju, Rep. of Korea, 2025.11.26-28
3. [Invited - Oral] **Ji-Seok Kim***, “Design of mechanical energy conversion devices for automation and sustainability”, The Korean Society of Composites Materials (KSCM), Yangjae aT center, Seoul, Rep. of Korea, 2025.11.19-21
4. [Domestic - Oral] **Ji-Seok Kim** and Il-Kwon Oh*, “Self-Powered Health Monitoring System Based on Footstep-Induced Kinetic and Pneumatic Energy Harvesting”, Dynamics, Control, and Robot Division, Korea Society of Mechanical Engineering, KAL Hotel, Jeju, Rep. of Korea, 2025.04.22-25
5. [International - Poster] **Ji-Seok Kim** and Il-Kwon Oh*, “Biomechanical energy harvesting device for smart wearable systems”, SPIE Smart Structures + Nondestructive Evaluation 2025, Sheraton Vancouver Wall Centre, Vancouver, BC, Canada, 2025.03.17-20
6. [Domestic - Poster] **Ji-Seok Kim** and Il-Kwon Oh*, “Development of Battery Charging Device Based on Small-Scale Electromagnetic Generator”, The Korean Society of Composites Materials (KSCM), BPEX, Busan, Rep. of Korea, 2024.11.13-15
7. [Domestic - Oral] **Ji-Seok Kim** and Il-Kwon Oh*, “Development of AC/DC Converting Circuit for Improving Efficiency of Triboelectric Nanogenerator”, The Korean Society of Mechanical Engineers (KSME), Jeju ICC, Jeju, Rep. of Korea, 2024.11.06-09
8. [International - Poster] **Ji-Seok Kim** and Il-Kwon Oh*, “Enhancing Wearable Device Functionality through Mechanical Motion Energy”, The 7th International Conference on Active Materials and Soft Mechatronics (AMSM 2024), Songdo ConvensiA, Incheon, Rep. of Korea, 2024.10.27-30
9. [International - Poster] **Ji-Seok Kim** and Il-Kwon Oh*, “Hybrid Biomechanical Energy Harvesting for Wearable Microgrids”, 2024 Materials Research Society (MRS) Spring Meeting & Exhibit, Seattle, Washington, USA, 2024.04.22-26
10. [Domestic - Poster] **Ji-Seok Kim**, Hyunjoon Yoo, and Il-Kwon Oh*, “Development of Power Management Circuit System to Efficiently Harvest Harmonic Output Derived from Freestanding mode Triboelectric Nanogenerator with Interdigitated Electrodes”, The

- Korean Society of Mechanical Engineers (KSME), Yeosu Expo Convention Center, Yeosu, Rep. of Korea, 2024.04.24-26
11. [Domestic - Oral] **Ji-Seok Kim**, Junseong Ahn, Jun-Ho Jeong, Inkyu Park, and Il-Kwon Oh*, “Development of High-Performance Triboelectric Nanogenerator Based on Nanohole Pattern”, KSME Annual Meeting 2023, Songdo Convensia, Songdo, Incheon, Rep. of Korea, 2023.11.01-03
 12. [International - Poster] **Ji-Seok Kim**, Hyunjoon Yoo, and Il-Kwon Oh*, “Mechanical Regulation Systems for Boosting Energy Harvesting Performance”, NANO KOREA 2023 Symposium, KINTEX, Ilsan, Rep. of Korea, 2023.07.05-07
 13. [Domestic - Poster] **Ji-Seok Kim** and Il-Kwon Oh*, “The Development of Buoy-Type Ocean Energy Harvesting Structure”, The Korean Society of Mechanical Engineers (KSME), BEXCO, Busan, Rep. of Korea, 2023.05.17-20
 14. [International - Oral] **Ji-Seok Kim**, Junseong Ahn, Jun-Ho Jeong, Inkyu Park, and Il-Kwon Oh*, “Buoy-Type Ocean Wave Energy Harvester for Powering Ocean Monitoring System”, 2023 SPIE SMART STRUCTURES+NONDESTRUCTIVE EVALUATION: Nano-, Bio-, Info-Tech Sensors, and Wearable Systems 2023, Long Beach, California, USA, 2023.03.12-16
 15. [International - Poster] **Ji-Seok Kim**, Junseong Ahn, Jun-Ho Jeong, Inkyu Park, and Il-Kwon Oh*, “Triboelectric Energy Harvesting System Based on Recyclable Polymers and Electrodes”, 2022 Materials Research Society (MRS) Fall Meeting & Exhibit, Boston, Massachusetts, USA, 2022.11.27-2022.12.2
 16. [International - Oral] **Ji-Seok Kim**, Hyunjoon Yoo, and Il-Kwon Oh*, “The Development of Triboelectric Nanogenerators Based on Flow-Induced Impacting-Sliding Cylinder”, The 6th International Conference on Active Materials and Soft Mechatronics (AMSM 2022), Georgia Tech., Atlanta, Georgia, USA, 2022.10.26-29
 17. [International - Oral] **Ji-Seok Kim** and Il-Kwon Oh*, “Flow-Induced Impacting Cylinder-Based Hybrid Mode Triboelectric Nanogenerators for Ocean Energy Harvesting”, NANO KOREA 2022 Symposium, KINTEX Ilsan, Ilsan, Rep. of Korea, 2022.07.06-08
 18. [Domestic - Oral] **Ji-Seok Kim**, Hee-Seon Seo, Yohan Cho, and Il-Kwon Oh*, “The Development of Triboelectric Energy Harvester Based on Flow-Induced Vibration”, Korea Institute of Military Science and Technology (KIMST), ICC Jeju, Jeju, Rep. of Korea, 2022.06.09-10
 19. [Domestic - Oral] **Ji-Seok Kim**, Hyunjoon Yoo, Hee-Seon Seo, Yohan Cho, and Il-Kwon Oh*, “Triboelectric Energy Harvesting System Using Water Flow-Induced Oscillating Cylinder Based on Impacting”, The Acoustical Society of Korea, Phoenix Pyeongchang Hotel, Pyeongchang, Rep. of Korea, 2022.05.18-20
 20. [International - Oral] Kwan-Woo Han, **Ji-Seok Kim**, Jong-Nam Kim, Manmatha Mahato, Hyunjoon Yoo, and Il-Kwon Oh*, “Long-lasting and steady triboelectric energy harvesting system based on escapement mechanism”, SPIE Smart Structures + Nondestructive Evaluation 2022, Online, 2022.04.04-10
 21. [Domestic - Oral] Kwan-Woo Han, **Ji-Seok Kim**, Jong-Nam Kim, and Il-Kwon Oh*, “Study on Performance Improvement of Escapement-Based Triboelectric Energy Harvester Based on Micropattern”, Korea Military Robotics Society (KMRS), DCC, Daejeon, Rep. of Korea, 2021.12.13-15
 22. [Domestic - Oral] Kwan-Woo Han, **Ji-Seok Kim**, Jong-Nam Kim, and Il-Kwon Oh*, “Development of Escapement-Based Triboelectric Nanogenerator for Ocean Energy Harvesting”, Korea Institute of Military Science and Technology (KIMST), DCC, Daejeon, Rep. of Korea, 2021.11.11-12
 23. [Domestic - Oral] **Ji-Seok Kim**, Jun-Young Kim, Jong-Nam Kim, and Il-Kwon Oh*, “Freestanding mode triboelectric energy harvester for ocean energy harvesting”, The

Korean Society of Mechanical Engineers (KSME), Lotte Resort Buyeo, Buyeo, Rep. of Korea, 2021.04.26-28

24. [International - Oral] **Ji-Seok Kim**, Jung-Hwan Oh, and Il-Kwon Oh*, “2D Wrinkled Graphene Oxide-Wrapped 3D Auxetic foam for Sound Wave and Shock Energy Multi-Dissipation”, Symposium on the Acoustics of Poro-Elastic Materials (SAPEM2021), Online, 2021.03.29-2021.04.02
25. [Domestic - Oral] **Ji-Seok Kim**, Jung-Hwan Oh, and Il-Kwon Oh*, “Porous Polyurethane Passive Sound Absorbing Materials Efficient in a Wide Frequency Range Based on Surface Micropattern”, The Korean Society for Noise and Vibration Engineering (KSNVE), Jeju KAL Hotel, Jeju, Rep. of Korea, 2020.11.17-20
26. [Domestic - Poster] **Ji-Seok Kim**, Jong-Nam Kim, and Il-Kwon Oh*, “Interdigitated Electrodes System for Freestanding Sliding Mode of Triboelectric Energy Harvesting”, The Korean Society for Composite Materials (KSCM), GSCO, Gunsan, Rep. of Korea, 2020.08.18-19
27. [Domestic - Oral] **Ji-Seok Kim**, Jung-Hwan Oh, and Il-Kwon Oh*, “Development of Method for Coating PLA onto Framework of Polyurethane Foam Structures”, The Korean Society for Composite Materials (KSCM), CECO, Changwon, Rep. of Korea, 2019.12.04-05
28. [International - Poster] **Ji-Seok Kim**, Jung-Hwan Oh, and Il-Kwon Oh*, “Development of Shock Absorbing Materials based on Auxetics”, The 4th International Conference on Active Materials and Soft Mechatronics (AMSM 2019), Sheraton Grand Incheon Hotel, Incheon, Rep. of Korea, 2019.10.16-19
29. [Domestic - Poster] **Ji-Seok Kim**, Ji-Su Ha, Jin-Young Jung, and Il-Kwon Oh*, “Auxetic Metamaterials Based on Local Resonance with Wide Band Gap at Low Frequencies”, The Korean Society for Composite Materials (KSCM), Yeosu The Ocean Resort, Yeosu, Rep. of Korea, 2019.04.03-06

PATENTS

1. 역진자 구조 기반의 쌍안정 에너지 하베스터 및 이를 이용한 에너지 수확 방법, 특허 출원 번호: 10-2023-0105756, 출원일: 2023.08.11, 특허 등록 번호: 10-2882645, 등록일: 2025.11.03
2. 에어 펌핑 기반 회전 운동 변환 장치 및 이를 이용한 에너지 수확 장치, 특허 출원 번호: 10-2024-0016160, 출원일: 2024.02.01
3. 미세 패턴 오그제틱 폼 및 미세 패턴 오그제틱 폼의 제조 방법, 특허 출원 번호: 10-2022-0067837, 출원일: 2022.06.02
4. 충돌을 이용한 에너지 하베스팅 장치, 특허 출원 번호: 10-2022-0064345, 출원일: 2022.05.25
5. 마찰 전기 에너지 하베스터, 이를 포함하는 장치 및 마찰 전기 에너지 하베스터의 충격 감지 방법, 특허 출원 번호: 10-2022-0020379, 출원일: 2022.02.16
6. 소음-진동 및 충격 흡수를 위한 그래핀 기반 오그제틱 다공성 구조체 및 그 제조방법, 특허 출원 번호: 10-2019-0080703, 출원일: 2019.07.04, 특허 등록 번호: 10-2325853-0000, 등록일: 2021.11.08

7. 정전기를 이용한 항바이러스 및 항균 마스크, 특허 출원 번호: 10-2020-0184654, 출원일: 2020.12.28

AWARDS AND HONORS

- **2025 KAIST Best Ph.D. Graduate Award** (한국기계연구원장상), KAIST, December 2025
- **Best Thesis Award**, Division of Dynamics, Control, and Robotics, Korean Society of Mechanical Engineers (KSME), April 2025
- **Best Research Award**, BK21 Four Advanced Materials Based Smart Factory Fostering Global Talents for Innovative Growth Program(첨단소재 기반 스마트팩토리 글로벌인재양성 사업팀), Dongguk University, March 2023
- **2022 YDB Foundation Scholarship** (우덕윤덕병재단 장학생), KAIST, Fall 2022
- **Best Presentation Award (Oral)**, The 6th International Conference on Active Materials and Soft Mechatronics (AMSM2022), “The Development of Triboelectric Nanogenerators Based on Flow-Induced Impacting-Sliding Cylinder”, Fall 2022
- **Best Presentation Award (Oral)**, The Acoustical Society of Korea (ASK), “Triboelectric Energy Harvesting System Using Water Flow-Induced Oscillating Cylinder Based on Impacting”, Spring 2022
- **Best Presentation Award (Poster)**, Korean Society for Composite Materials (KSCM), “Interdigitated Electrodes System for Freestanding Sliding Mode of Triboelectric Energy Harvesting”, Spring 2020
- **Outstanding Teaching Assistant Award**, Korea Advanced Institute of Science and Technology (KAIST), Dynamics, Fall 2019
- **Best Presentation Award (Oral)**, Korean Society for Composite Materials (KSCM), “Development of Method for Coating PLA onto Framework of Polyurethane Foam Structures”, Fall 2019