

GEONJUN CHOI

CURRICULUM VITAE

Department of Mechanical Engineering
Ulsan National Institute of Science and Technology (UNIST)
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EDUCATION

- | | |
|------------------|--|
| 9/2025 – present | Korea Advanced Institute of Science and Technology (KAIST)
Postdoc. in Mechanical Engineering
InnoCORE PRISM-AI Center
Research Advisor: Professor Inkyu Park |
| 3/2025 – 8/2025 | Ulsan National Institute of Science and Technology (UNIST)
Research Advisor: Professor Hoon Eui Jeong |
| 3/2019 – 2/2025 | Ulsan National Institute of Science and Technology (UNIST)
Ph. D. in Mechanical Engineering
Integrated Master's and Doctoral Course
Research Advisor: Professor Hoon Eui Jeong
<i>Dissertation: Motion and surface adaptable tessellated skin patches with switchable adhesion for wearable electronics</i> |
| 3/2015 – 2/2019 | Ulsan National Institute of Science and Technology (UNIST)
B.S. in Mechanical Engineering |

HONORS AND AWARDS

- **Excellence in Doctoral Research**, Mechanical Engineering, UNIST (2025)
- **Best Poster Award**, International Conference on Advanced Electromaterials (2021)

RESEARCH EXPERIENCE

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| 3/2019 – 8/2025 | Graduate Fellow at UNIST
(Research Advisor: Professor Hoon Eui Jeong) <ul style="list-style-type: none">• Development of motion- and surface-adaptable tessellated skin patches with switchable adhesion for skin-conformable electronics• Development of advanced adhesives with controllable crack propagation through integration of heterogeneous structures and shape memory polymers. |
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- Development of self-attachable flexible electrodes utilizing 3D microarchitecture with selectively deposited nanomaterials
- Synthesis of self-healing resilient hydrogels and their application as skin-attachable motion sensors
- Development of dynamically actuating surfaces based on magneto-responsive composites for prevention of biofouling

TECHNICAL EXPERTISE

- **Multi-scale fabrication techniques:** photolithography, soft lithography for various 3D microarchitectures (e.g. mushroom-shaped micropillars, permeable micro-mesh, etc.), e-beam lithography, spray coating, sputtering, 3D printing.
- **Morphological analysis and surface characterization:** scanning electron microscopy (SEM), confocal microscopy (CM), laser microscopy, energy dispersive X-ray spectroscopy (EDS), atomic force microscopy (AFM), contact angle measurement.
- **Mechanical characterization:** adhesion test (normal, shear, peeling), friction test, tensile and compression test, dynamic mechanical analysis (DMA), rheological test, particle image velocimetry (PIV).
- **Electrical and optical properties:** two-wire and four-wire resistance measurements, analysis of electrical contact resistance, impedance spectroscopy, UV-Vis-NIR spectroscopy.
- **Material characterization:** Fourier transform infrared spectroscopy (FT-IR), X-ray photoelectron spectroscopy (XPS), X-ray diffraction (XRD) analysis, laser flash analysis (LFA), steady-state method for thermal contact resistance, thermogravimetric analysis (TGA), differential scanning calorimetry (DSC).
- **Software:** Finite element analysis (COMSOL Multiphysics, MATLAB), 3D CAD (CATIA, SolidWorks, AutoCAD, KeyShot), and imaging tools (Origin, Adobe Photoshop, ImageJ, Imaris).

RESEARCH PUBLICATION

[†] is equally contributed

1. J. Kim[†], **G. Choi[†]**, S. Park, J. W. Han, H. W. Park*, H. E. Jeong*, “Water-Repellent, Surface-Adaptive, and Switchable Adhesive Patch Using Microstructured Shape Memory Polymers”, *Small Struct.*, (2026) [IF: 11.3]
2. **G. Choi[†]**, J. Kim[†], H. Kim, H. Bae, B.-J. Kim, H. J. Lee, H. Jang, M. Seong, S. M. Tawfik, J. J. Kim*, and H. E. Jeong*, “Motion-Adaptive Tessellated Skin Patches with Switchable Adhesion for Wearable Electronics”, *Adv. Mater.*, (2025) [IF: 27.4] - **Cover Article**
3. J. Kim[†], **G. Choi[†]**, S. Park, M. Kim, K. Kim, H.- S. Jung, K. Kwak, J. G. Ok*, and H. E. Jeong*, “Smart Mechanical Structures and Design for Advanced Adhesives: A Review”, *Int. J. Precis. Eng. Manuf.*, (2025) [IF: 2.6]
4. S. Lee[†], **G. Choi[†]**, J. Kim, S. Park, S. Kim, J. Kang, S. M. Tawfik, and H. E. Jeong*, “Self-Attachable and Conductive Hydrogel Adhesive Patch”, *Nano Select*, (2025) [IF:

3.0]

5. S. Park, D. Kang, D. Lee, **G. Choi**, J. Kim, C. Lee, M. Seong, M. D. Bartlett* and H. E. Jeong*, “Multiscale Crack-Trapping for Programmable Adhesives”, *Sci. Adv.*, (2024) [IF: 11.7]
6. S. Kondaveeti†, **G. Choi**†, S. C. Veerla, S. Kim, J. Kim, H. J. Lee, U. Kuzhiumparambil, P. J. Ralph, J. Yeo*, and H. E. Jeong*, “Mussel-inspired resilient hydrogels with strong skin adhesion and high-sensitivity for wearable device”, *Nano Conver.*, (2024) [IF: 13.5]
7. H. Ji, H. Son, K. Kim, **G. Choi**, M. Kim, I. Han, H. E. Jeong*, and Jong G. Ok*, “All-Solution-based, Low-to-Room-Temperature Fabrication of Position-Controlled Metal-Nanodot-Decorated Semiconductor Nanorods for Enhanced Optoelectronic Transducers”, *ACS Appl. Nano Mater.*, (2024) [IF: 5.3]
8. H. Lee, H. Kim, T. Kim, H. Kim, J. Mun, **G. Choi**, H. E. Jeong*, and J. Y. Yeo*, “Adhesive-Free PDMS/PUA Bilayer Using Selective Photopolymerization for Transparent, Attachable, and Wearable Triboelectric Nanogenerator”, *Nano Energy*, (2024) [IF: 16.8]
9. S. Park†, **G. Choi**†, M. Kang†, W. Kim, J. Kim*, and H. E. Jeong*, “Bioinspired Magnetic Cilia: From Materials to Applications”, *Microsyst. Nanoeng.*, (2023) [IF: 7.3]
10. S. Choi, B. S. Kang, **G. Choi**, M. Kang, H. Park, N. Kim, P.-S. Chang, M. K. Kwak, H. E. Jeong*, and H.-S. Jung*, “Multichamber PLGA Microparticles with Enhanced Monodispersity and Encapsulation Efficiency Fabricated by a Batch-Microfluidic Hybrid Approach”, *Adv. NanoBiomed Res.*, (2023) [IF: 4.0]
11. M. Seong, S. Kondaveeti, **G. Choi**, S. Kim, J. Kim, M. Kang, and H. E. Jeong*, “3D Printable Self-Adhesive and Self-Healing Ionotronic Hydrogels for Wearable Healthcare Devices”, *ACS Appl. Mater. Interfaces.*, (2023) [IF: 8.5]
12. H. Jang†, **G. Choi**†, M. Kang†, S. Kim, M. Seong, S.-H. Lee, H.W. Park, and H. E. Jeong*, “Dynamically Actuating Nanospoke Composites as a Bioinspired Antibiofilm Material”, *Compos. Sci. Technol.*, (2022) [IF: 8.3]
13. M. Seong, I. Hwang, S. Park, H. Jang, **G. Choi**, J. Kim, S.-K. Kim, G.-H. Kim, J. Yeo, and H. E. Jeong*, “Enhanced Thermal Transport across Self-Interfacing van der Waals Contacts in Flexible Thermal Devices”, *Adv. Funct. Mater.*, (2022) [IF: 18.5]
14. M. Kang, K. Sun, M. Seong, I. Hwang, H. Jang, S. J. Park, **G. Choi**, S. -H. Lee, J. Kim, and H. E. Jeong*, “Applications of Bioinspired Reversible Dry and Wet Adhesives: A Review”, *Front. Mech. Eng.*, (2021) [IF: 4.7]
15. **G. Choi**†, H. Ko†, H. Jang, I. Hwang, M. Seong, K. Sun, H.-H. Park, T.-E. Park, J. Kim*, and H. E. Jeong*, “Biofouling-resistant tubular fluidic device with magneto-responsive dynamic walls”, *Soft Matter*, (2021) [IF: 2.9] - **Cover Article**
16. **G. Choi** and H. E. Jeong*, “A cutting-edge solution for adhesives”, *Nat. Mater.*, (2023) [IF: 37.2] – **News and Views**
17. S.-H. Lee, J. Kim, M. Seong, H. Jang, **G. Choi**, and H. E. Jeong*, “Anti-Icing Technology based on Drop Bouncing Dynamics for the Prevention of Freezing of Electric Power Equipment”, *JKSPE*, (2020) **KCI**

PATENTS

1. H. E. Jeong, J. Kim, M. Seong, **G. Choi**, "Skin-Attachable Patch with Micro-Adhesive Structure and Sensor for Measuring Biological Signal Thereof", Korean patent, 10-2760895-0000 (2025, Granted)
2. H. E. Jeong, **G. Choi**, M. Seong, J. Kim, "Skin-Attachable Patch Comprising Shape Memory Polymer and Sensor for Measuring Biological Signal Thereof", Korean patent, 10-2760901-0000 (2025, Granted)
3. H. E. Jeong, **G. Choi**, S. Kim, "Water-Repellent Adhesive Patch with Micro-Protrusion Structure", Korean patent, 10-2024-0122204 (2024, filed)
4. H. E. Jeong, **G. Choi**, H. Kwon, "Adhesive Patch Containing Induction Heating Controlled Magnetic Nanoparticles and Shape Memory Polymer", Korean patent, 10-2024-0122207 (2024, filed)
5. H. E. Jeong, **G. Choi**, H. Kwon, "Shape-Memory Polymer Based Conductive Circuits with Low Contact Resistance and Reconfigurability", Korean patent, 10-2024-0119810 (2024, filed)
6. H. E. Jeong, **G. Choi**, S. Kim, "Control of Crack Arrest Effect Based on Heterogeneous Stiffness Structure and Stiff Variable Materials", Korean patent, 10-2024-0098482 (2024, filed)
7. H. E. Jeong, J. J. Kim, J. Kim, S. Cho, **G. Choi**, "Wearable Device for Measuring Biosignal and Electronic Device Comprising the Same", Korean patent, 10-2024-0110045 (2024, filed)
8. H. E. Jeong, **G. Choi**, S. Lee, "Anisotropic Conductive Film and Its Manufacturing Method", Korean patent, 10-2024-0106626 (2024, filed)
9. H. E. Jeong, S. Kim, H. Kwon, S. Lee, **G. Choi**, "Soft Gripper and Soft Robot", Korean patent, 10-2024-0110620 (2024, filed)
10. H. E. Jeong, M. Seong, **G. Choi**, H. Song, "Skin-Attachable Patch Comprising Electroconductive Gel and Sensor for Measuring Biological Signal Thereof", Korean patent, 10-2670283-0000 (2024, Granted)
11. H. E. Jeong, M. Seong, I. Hwang, S.-H. Lee, J. Kim, **G. Choi**, "Electrode and the Manufacturing Method Thereof", Korean patent, 10-2670295-0000 (2024, Granted)
12. H. E. Jeong, **G. Choi**, S. Park, C. Park, M. Seong, S.-H. Lee, H. Bae, J. Y. Kim, J. Kim, "Adhesive Patch in Wet Conditions and Manufacturing Method of the Same", Korean patent, 10-2614237-0000 (2023, Granted)
13. H. E. Jeong, M. Seong, I. Hwang, S.-H. Lee, J. Kim, **G. Choi**, "Electrode and the Manufacturing Method Thereof", PCT/KR2022/007975 (2022, filed)
14. H. E. Jeong, **G. Choi**, J. Kim, "Dry Adhesive Structure Capable of Attachment and Detachment Using an Electric Field", Korean patent, 10-2122776-0000 (2020, Granted)

REFERENCES

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Dr. Jae Joon Kim

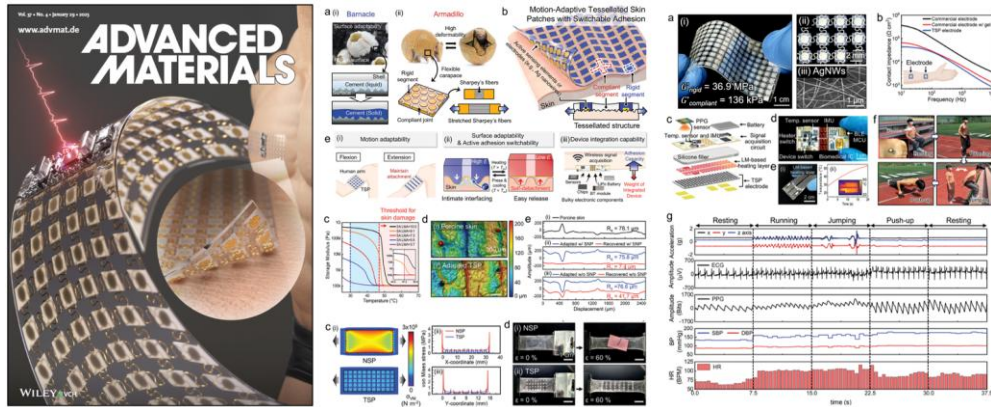
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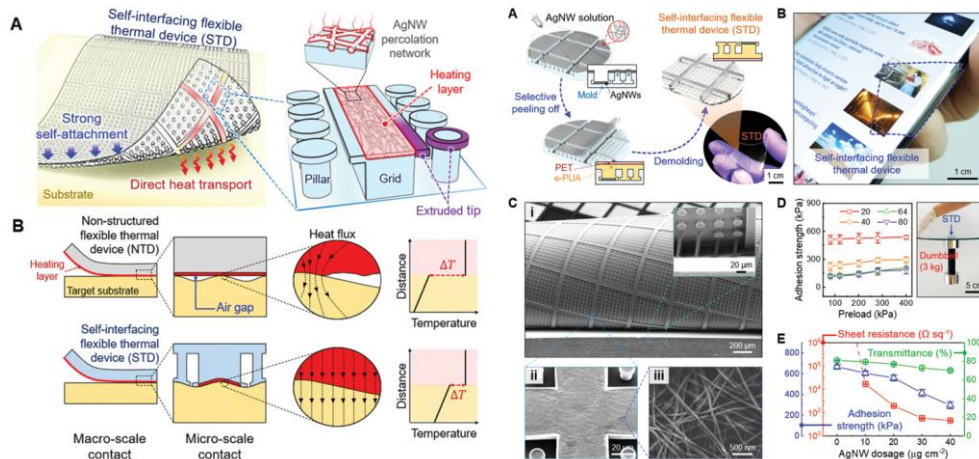
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GRAPHICAL REPRESENTATION OF SELECTED RESEARCH WORK

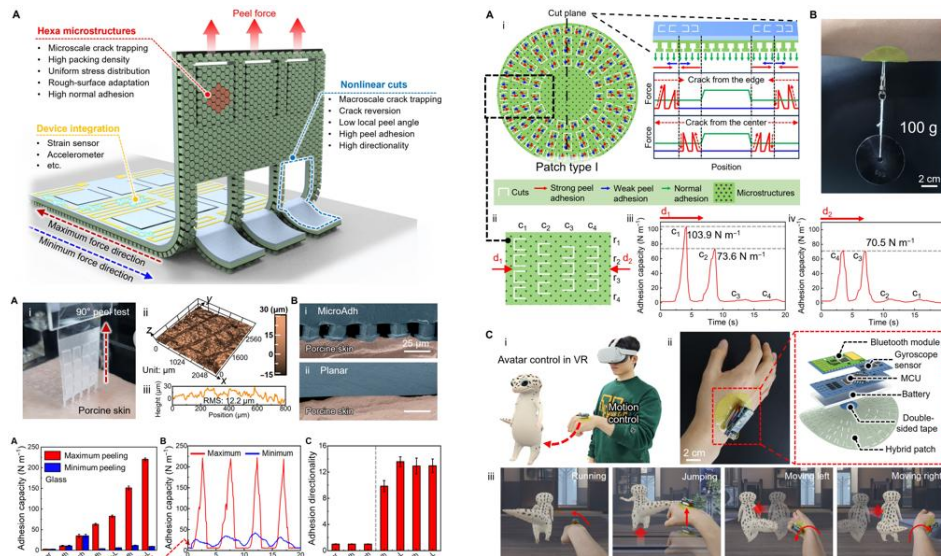
1. Motion-Adaptive Tessellated Skin Patches with Switchable Adhesion for Wearable Electronics



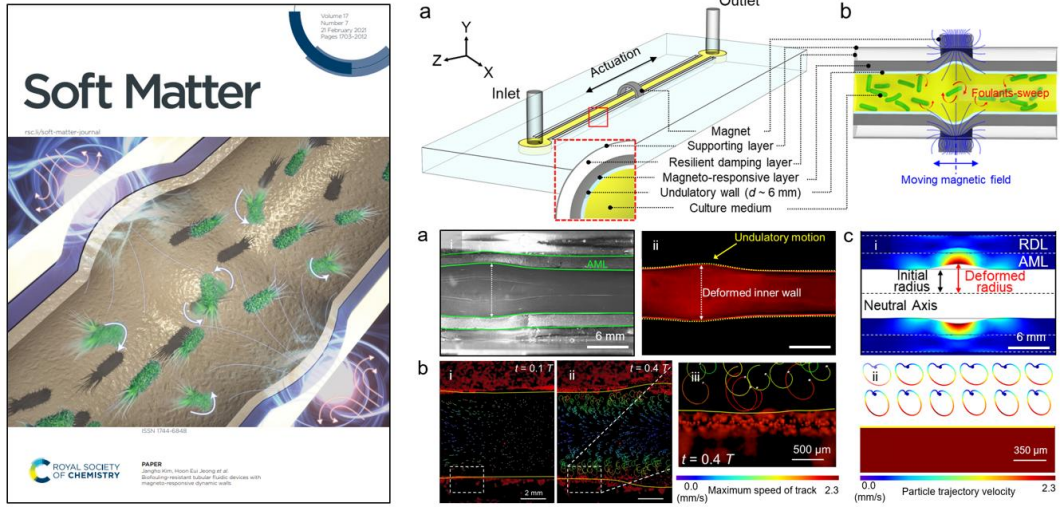
2. Enhanced Thermal Transport across Self-Interfacing van der Waals Contacts in Flexible Thermal Devices



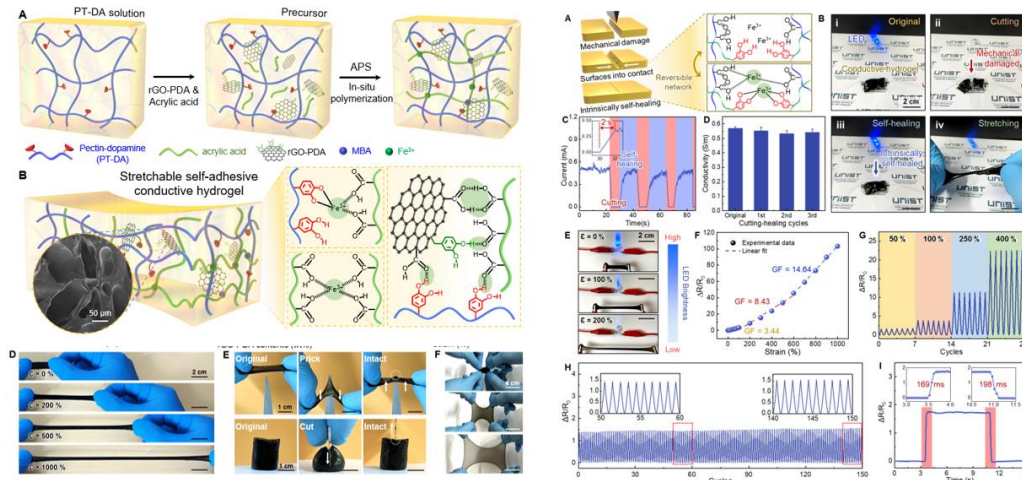
3. Multiscale crack trapping for programmable adhesives



4. Biofouling-resistant tubular fluidic devices with magneto-responsive dynamic walls



5. Mussel-inspired resilient hydrogels with strong skin adhesion and high-sensitivity for wearable device



6. Self-Attachable and Conductive Hydrogel Adhesive Patch

