Curriculum Vitae

JIHYUN KIM

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EDUCATION

M.S. & Ph.D. Department of Advanced Materials Science & Engineering, Sungkyunkwan University (SKKU), 2019- 2025

B.S. School of Chemical Engineering, Sungkyunkwan University (SKKU), Suwon, Korea, 2013-2019

PROFESSIONAL EXPERIENCE

Assistant Professor. Dept. of Intelligent Semiconductor Engineering, Ajou University, 2026.09 -

Postdoc Fellow. Research Laboratory of Electronics (RLE), Massachusetts Institute of Technology, 2025.09 - 2026.08

Postdoc Fellow. Department of Chemical and Biomolecular Engineering, Yonsei University, 2025.03 - 2025.08

PUBLICATIONS - ORCID: 0000-0002-3533-1622/ Google Scholar link († denotes co-first authors)

□ First & Co-first Author Publications (19)

- **J. Kim**†, P. Behera†... S. Cheema*, Multi-Scale Capacitor Engineering for Next-Generation AI Power Delivery Networks., Under review

- N. Khan†, **J. Kim**†.... J. Kang*, I. Kim*, Stand-alone MoS_2 Electron Transport Layers for Inverted Perovskite Solar Cells with Unprecedented UV Stability., Under review

[19] K. Nam†, **J. Kim**†, S. Ji†, I. Kim, S. Kim, E. Yeon, D. Hwang, I. Plutnarová, Z. Sofer, S. Won*, J. Kang*, Light-Induced Field-Tunneling Synapses in Solution-Processed Van Der Waals Heterostructures for Scalable, Retina-Inspired Optical Sensing., ***Adv. Funct. Mater***., in press

[18] **J. Kim**†, J. Yoon†, G. Kim†, K. Nam, J. Heo, I. Kim, D. Rhee*, D. Son*, J. Kang*, Multilevel Optical Programming of Intrinsic Vacancies in Solution-Processed MoS_2 Films for Retinomorphic Color Differentiation., ***Adv. Opt. Mater***., e03862, **2026** (**Highlighted in Front Cover Image**)

[17] **J. Kim**, J. Kang* Solution-Processed van der Waals Thin Films: From Scalable Fabrication of Electronic Devices to Advanced Optoelectronic Applications., ***J. Sens. Sci. Technol.***, 35, 1, **2026**, 30-40

[16] **J. Kim**†, H. Kim†, G. Cheon, D. Lee, I. Kim, U. Won, J. Lee, S. Won*, J. Kang*, Multicolor optoelectronic synapse enabled by photon-modulated remote doping in solution-processed van der Waals heterostructures., ***Adv. Funct. Mater.***, **2025**, e14177

[15] J. Min†, **J. Kim**†, S. Won*, J. Kang*, van der Waals Gap-Engineered Artificial Crystals: A Platform for Tunable Physical Properties and Emerging Device Applications., ***ACS Nano***., 19, 28, **2025**, 25567–25595

[14] K. Kim†, **J. Kim**†, M. Jung, I. Kim, B. Yu, S. Won, D. Son, H. Li, Z. Sofer, D. Hwang, D. Jariwala, J. Kang*, Sub-stoichiometric zirconium oxide as a solution-processed dielectric for reconfigurable electronics., ***Nat. Electron***., 8, **2025**, 461-473

[13] S. Kim†, **J. Kim**†, J. Kang*, W. Ryu*, Cathode wrapping strategy with metal chalcogenide nanosheet for safer and longer lasting Li-ion batteries., ***NPJ 2D Mater. Appl.***, 9, 14, **2025**

[12] I. Kwak†, **J. Kim**†, J. Moon, S. Kim, J. Park, O. Song, V. Mazánek, Z. Sofer, H. Jo, S. Park, M. Kang, J. Kang*, J. Cho*, Orthogonal Direct Photopatterning of Two-Dimensional Percolated Networks Enabling Wafer-Scale van der Waals Vertical Heterostructures., ***Nat. Electron***., 8, **2025**, 235-243 (**Highlighted in Front Cover Image**)

[11] T. Hassan†, **J. Kim**†**,** H.N. Manh, A. Iqbal, Z. Gao, Y. Kim, N. Hussain, M. Shabbir, S. Zaman, M. Narayanasamy, S. Lee*, J. Kang*, C. Koo*, Semiconducting Properties of Delaminated Titanium Nitride $Ti_4N_3T_x$ MXene with Gate-Tunable Electrical Conductivity., ***ACS Nano***., 18, 34, **2024**, 23477-23488

[10] **J. Kim,** D. Rhee, M. Jung, G. Cheon, K. Kim, J. Kim, J. Park, J. Yoon, D. Lim, J. Cho, I. Kim, D. Son, D. Jariwala, J. Kang*, Defect-Engineered Semiconducting van der Waals Thin Film at Metal–Semiconductor Interface of Field-Effect Transistors., ***ACS Nano***., 18 (1), **2024**, 1073-1083

[9] S. Lee†, **J. Kim**†, H. Kwon†, D. Son*, I. Kim*, J. Kang*, Photoactive materials and devices for energy-efficient soft wearable optoelectronic systems., ***Nano Energy***., 110, **2023**, 108379

[8] Y. A. Kwon†, **J. Kim**†, S. Jo, D. Roe, D. Rhee, Y. Song, B. Kang, D. Kim, J. Kim, D. Kim, M. Kang, J. Kang*, J. Cho*, Wafer-scale transistor arrays fabricated using slot-die printing of molybdenum disulfide and sodium-embedded alumina., ***Nat. Electron***., 6, **2023**, 443-450

[7] **J. Kim**†, J. Lee†, M. Jung, J. Kim, J. Park, H. Kim*, and J. Kang*, Transparent, Multivalued Transistors Enabled by Area- Selective Optical Doping on Ga-Doped IZTO Thin Films., ***Adv. Electron. Mater.***, **2022**, 202200771

[6] A. Thacharon†, W. Jang†, **J. Kim**†, J. Kang*, Y. Kim*, and S. Kim*, Non-Oxidized Bare Metal Nanoparticles in Air: A Rational Approach for Large-Scale Synthesis via Wet Chemical Process., ***Adv. Sci.***, 9, **2022**, 2201756

[5] **J. Kim**, O. Song, Y. Cho, M. Jung, D. Rhee, and J. Kang*, Revisiting Solution-Based Processing of van der Waals Layered Materials for Electronics., ***ACS. Mater. Au.***, 2, **2022**, 382-393

[4] **J. Kim**†, D. Rhee†, O. Song†, M. Kim, Y. Kwon, D. Lim, I. Kim, V. Mazánek, L. Valdman, Z. Sofer, J. Cho, and J. Kang*, All-Solution-Processed Van der Waals Heterostructures for Wafer-Scale Electronics., ***Adv. Mater***., 32, **2022**, 2106110 (**Highlighted in Back Cover Image**)

[3] **J. Kim**†, M. Jung†, D. Lim, D. Rhee, S. Jung, H. Cho, H. Kim, J. Cho, and J. Kang*, Area-Selective Chemical Doping on Solution-Processed MoS_2 Thin- Film for Multi-Valued Logic Gates., ***Nano Letters***., 22, **2022**, 570-577 (**Highlighted in Cover Image**)

[2] Y. Choi†, **J. Kim**†, M. Kim, H. Ryu, H. Woo, J. Cho*, and J Kang*, Hysteresis Behavior of the Donor–Acceptor-Type Ambipolar Semiconductor for Non-Volatile Memory Applications., ***Micromachines***., 12, **2021**, 301

[1] **J. Kim**†, S. Kim†, Y. Cho, M. Choi, S. Jung, J. Cho, D. Whang*, and J. Kang*, Solution-Processed MoS_2 Film with Functional Interfaces via Precursor-Assisted Chemical Welding., ***ACS Appl. Mater. Interfaces***., 13 (10), **2021**, 12221-12229

□ Co-author Publications (23)

[23] J. Min†, Y. A. Kwon†, H. Kim†, **J. Kim**, M. Jung, J. Heo, G. Kim, V. Mazanek, Z. Sofer, I. Kim, J. Cho, H. Park*, S. Won*, J. Kang*, Solution-Processed Two-Dimensional Indium Oxide on Sodium-Embedded Alumina for Reconfigurable Optoelectronic Synaptic Transistors., ***Adv. Funct. Mater***., e75703, **2026**, https://doi.org/10.1002/adfm.75703 (**Highlighted in Front Cover Image**)

[22] W. Zhu†, C. Kim†, R. Zhang, M. Lu, N. Hur, H. Cho, **J. Kim**, J. Sun, J. Kang, J. Yan, Y. Cheng*, J. Suh*, Self-reconfigurable polarization perception in dual-anisotropy heterostructures for high-dimensional in-sensor computing., ***Nat. Sens***., https://doi.org/10.1038/s44460-026-00057-9, **2026**,

[21] S. Ki†, I. Kwak†, S. Kim, **J. Kim**, D. Roe, S. Kim, J. Kang*, J. Cho* Alkali Ion-Incorporated HfO_2 Dielectrics for Reconfigurable Neuromorphic Computing., ***Adv. Funct. Mater.***, **2025**, e21002

[20] I. Kwak†, S. Kim†, W. Cho†, **J, Kim**, S. Kim, Y.A. Kwon, V. Mazanek, Z. Sofer, J. Keum, Y. Heo, M. Kang, B. Kim*, J. Kang*, J. Cho*, Direct Photopatterning of Green Solvent-Processed 2D Nanomaterials for Wafer-Scale Electronics., ***Adv. Mater.***, 37 (40), **2025**, e05917

[19] J. Lee†, S. Han†, C. Choi, C. Seo, S. Hwang, **J. Kim**, J. Hong, J. Jang, J. Kyhm, J. W. Kim, B. Yu, J. Lim, G. Wang, J. Kang, Y. Kim, S. Ahn, J. Ahn, D. Hwang*, Polarization-sensitive in-sensor computing in chiral organic integrated 2D p-n heterostructures for mixed-multimodal image processing., ***Nat. Commun***., 16, **2025**, 4624

[18] D. Koo, Y. Choi, U. Kim, **J. Kim**, J. Seo, E. Son, H. Min, J. Kang, H. Park*, Mesoporous structured MoS_2 as an electron transport layer for efficient and stable perovskite solar cells., ***Nat. Nanotechnol***., 20, **2024**, 75-82

[17] B. Jo, K. Kim, S. Lee, H. Kim, **J. Kim**, J. Kang, G. Namkoong, G. Han*, H. Jung*, High Performance Blue-Targeted Photodetectors Based on Cross-Linked Perovskite/Polymer Composites with Sodium Borate., ***Chem. Mater***., 35(24), **2023**, 10495-10503

[16] O. Song, D. Rhee, **J. Kim**, M. Jung, S. Kim, I. Kim, J. Kang*, Solution-Processed 2D Transition Metal Dichalcogenide Networks for Scalable Flexible Photosynaptic Device Arrays., ***IEEE J Sel Top Quantum Electron***., **2023**, doi: 10.1109/JSTQE.2023.3307515

[15] B. Jo, I. Cho, K. Kim, C. Sohn, **J. Kim**, J. Kang, G. Han*, H. Jung*, Composition, additive, and process engineering of halide perovskite green photodetector for enhanced responsivity and detectivity., ***J. Alloys Compd***., 961, **2023**, 170869

[14] D. Rhee, B. Han, M. Jung, **J. Kim**, O. Okin, J. Kang*, Hierarchical Nanoscale Structuring of Solution-Processed 2D van der Waals Networks for Wafer-Scale, Stretchable Electronics., ***ACS Appl. Mater. Interfaces***., 14, **2022**, 57153-57164

[13] D. Rhee, **J. Kim**, J. Kang*, Solution-Processed Two-Dimensional Materials for Scalable Production of Photodetector Arrays., ***J. Sens. Technol.***, 31, **2022**, 228-237

[12] Y. Yun, G. Han*, G. Park, **J. Kim**, J. Park, D. Vidyasagar, J. Jung, W. Choi, Y. Choi, K. Heo, J. Kang, J. Park, H. Jung*, S. Lee*, A Wide Bandgap Halide Perovskite Based Self-Powered Blue Photodetector with 84.9% of External Quantum Efficiency., ***Adv. Mater.,*** 34, **2022**, 2206932 (**Highlighted in Front Cover Image**)

[11] K. Ahn, G. Kim, S. Kim, **J. Kim**, G. Ryu, P. Lee, B. Ryu, J. Cho, Y. Kim, J. Kang, H. Kim, Y. Noh*, M. Kim*, Highly Conductive p-Type Transparent Conducting Electrode with Sulfur-Doped Copper Iodide., ***Chem. Mater.***, 34, **2022**, 10517-10527

[10] O. Song†, D. Rhee†, **J. Kim**, Y. Jeon, V. Mazánek, A. Söll, Y.A. Kwon, J. Cho, Y. Kim1, Z. Sofer, and J. Kang*, All inkjet-printed electronics based on electrochemically exfoliated two-dimensional metal, semiconductor, and dielectric., ***NPJ 2D Mater. Appl.***, 6, **2022**, 64

[9] Y. Cho†, D. Rhee†, J. Eom, **J. Kim**, M. Jung, Y. Son, Y. Han, K. Kim, and J. Kang*, Scalable Synthesis of Pt Nanoflowers on Solution-Processed MoS_2 Thin Film for Efficient Hydrogen Evolution Reaction., ***Small Sci.***, 2, **2022**, 2200043 (**Highlighted in Front Cover Image**)

[8] M. Lee†, D. Rhee†, **J. Kim**, C. Park, M. Kim*, J. Kang*, and Y. Lee*, Solution-Processed MoS2-Based Back-to-Back Diodes Circuit Applications for Signal Demodulators and Envelope Detectors., ***ACS Mater. Lett.***, 4, **2022**, 1556-1564

[7] S. Choi, H. Seok, **J. Kim**, J. Kang, and H. Kim*, Transparent and flexible passivation of MoS_2/Ag nanowire with sputtered polytetrafluoroethylene film for high performance flexible heaters., ***Sci. Rep.***, 12, **2022**, 6010

[6] S. Kim†, S. Jo†, **J. Kim**, D. Rhee, Y. Choi, D. Kim, J. Kang*, and J. Cho*, Gate-Deterministic Remote Doping Enables Highly Retentive Graphene- MXene Hybrid Memory Devices on Plastic., ***Adv. Funct. Mater***., 32, **2022**, 2111956

[5] Y. Jeon†, J. Seo†, **J. Kim**, D. Rhee, M. Jung, H. Park*, and J. Kang*, Wafer-Scale Two-Dimensional Molybdenum Diselenide Phototransistor Array via Liquid-Precursor-Assisted Chemical Vapor Deposition., ***Adv. Opt. Mater.***, 10, **2022**, 2101492

[4] V. Raman†, D. Rhee†, A. R. Selvaraj, **J. Kim**, K. Prabakar, J. Kang* and H. Kim*, High-performance flexible transparent micro- supercapacitors from nanocomposite electrodes encapsulated with solution processed MoS_2 nanosheets., ***Sci. Technol. Adv. Mater.***, 22, **2021**, 875-884

[3] M. Kim†, J. Seo†, **J. Kim**, J. Moon, J. Lee, J. Kim, J. Kang*, and H. Park*, High-Crystalline Monolayer Transition Metal Dichalcogenides Films for Wafer-Scale Electronics., ***ACS Nano***., 15 (2), **2021**, 3038-3046

[2] S. Bok, H. Seok, Y. Kim, J. Park, **J. Kim**, J. Kang*, H. Kim*, and B. Lim*, Transparent Molecular Adhesive Enabling Mechanically Stable ITO., ***ACS Appl. Mater. Interfaces***., 13, 2, **2021**, 3463-3470

[1] J. Lee, J. Heo, H. Lim, J. Seo, Y. Kim, **J. Kim**, U. Kim, Y. Choi, S. Kim, Y. Yoon, T. Shin, J. Kang, S. Kwak*, J. Kim*, and H. Park*, Defect-Induced in Situ Atomic Doping in Transition Metal Dichalcogenides via Liquid- Phase Synthesis toward Efficient Electrochemical Activity., ***ACS Nano***., 14, **2020**, 17114-17124

PATENTS

[1] 2차원 반도체 물질 복합체 및 이의 제조 방법,
J. Kang; **J. Kim**
(Registration number: 10-2485616, KR patent)

[2] 다진법 연산을 위한 준-이종 반도체 접합 전자소자 및 이의 제조방법,
J. Kang; **J. Kim**; M. Jung
(Registration number: 10-2545055, KR patent)

[3] 용액공정을 통한 대면적 고성능 반도체소자 제조방법,
J. Kang; **J. Kim**
(Registration number: 10-2663018, KR patent)

[4] 2차원물질 분산액 제조방법 및 이를 이용한 대면적 반도체 소자 제조방법,
J. Kang; **J. Kim**
(Registration number: 10-2680442, KR patent)

[5] 이온이 주입된 알루미나를 포함하는 유전막, 이의 제조방법, 및 이를 포함하는 전자소자의 제조방법,
J. Kang; J. Cho; **J. Kim**; Y. Kwon
(Registration number: 10-2917936, KR patent)

[6] 인터페이스 반도체 기반 트랜지스터 및 이의 제조방법,
J. Kang; **J. Kim**
(Registration number: 10-2908129, KR patent)

[7] 광가교를 이용한 광 패터닝 방법을 적용한 이종 접합 반도체 소자 제조 방법 및 이를 통해 제조된 이종 접합 반도체 소자,
J. Kang; J. Cho; **J. Kim**; I. Kwak; H. Kim
(Registration number: 10-2865181, KR patent)

AWARDS

2025	Best Oral Presentation, GCIM2025, Material Research Society of Korea
2025	Best Oral Presentation, Young Scientist Forum, The Korean Sensors Society
2024	Best Oral Presentation, ECS PRIME
2024	Outstanding BK21 Student Award (AMSE Award-1st place)
2024	Best Poster Award, ACS Nano Summit Symposium 2024
2024	IUMRS-ICYRAM Young Research Award
2023	BK21 Minister of Education Award-**교육부 장관 표창**

2023 Outstanding BK21 Student Award (AMSE Award-2nd place)

2023 Best Oral Presentation, The Korean Institute of Electrical and Electronic Material Engineers

2022 Best Oral Presentation, The Korean Institute of Electrical and Electronic Material Engineers

2022 Best Oral Presentation, The Korean Institute of METALS AND MATERIALS

2022 Outstanding BK21 Student Award (AMSE Award-5th place)

2021 Best Oral Presentation, The Korean Institute of METALS AND MATERIALS

RESEARCH PROJECT

[2] Sejong Science Fellowship (Oversea track) "AI-in-sensor intelligent electronic-skin via solution-processed ferroelectric-semiconductor platform" the Ministry of Science and ICT, Korea/ 2025-2026

[1] Ph.D. Research Fellowship "High Accuracy Panchromatic Imaging Using Self-Adaptive Artificial Eye Based on van der Waals Thin-Films" the Ministry of Science and ICT, Korea/ 2023-2024

REFERENCE

[1] **Joohoon Kang** (Ph.D advisor), Yonsei University, Department of Chemical and Biomolecular Engineering (joohoon@yonsei.ac.kr)

[2] **Suraj Cheema** (Postdoc advisor), Massachusetts Institute of Technology, Research Laboratory of Electronics (sscheema@mit.edu)

[3] **Jeong Ho Cho** (Collaborative professor), Yonsei University, Department of Chemical and Biomolecular Engineering (jhcho94@yonsei.ac.kr)

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[5] **Donghee Son** (Collaborative professor), Yonsei University, Department of Chemical and Biomolecular Engineering (daniel3600@yonsei.ac.kr)