Wonvin Kim

Ph.D.

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EDUCATION

Ph.D.	**KAIST** Mechanical Engineering Advisor: Professor Seong Su Kim	Daejeon, South Korea	2019 - 2025
B.S.	**KAIST** Mechanical Engineering Advisor: Professor Ilkwon Oh	Daejeon, South Korea	2015 - 2019 (Magna Cum Laude)

RESEARCH INTERESTS

Tribology (Water-lubricated composite journal bearing), Organic-based thermoelectricity for Energy harvesting, Composite manufacturing, Lithium-ion battery

PUBLICATIONS

1. **Wonvin Kim**, Su Hyun Lim, Dajeong Kang, Sangyoon Bae, Seung Yoon On, Seong Su Kim*, “Research trends and future perspective in nonconventional machining of fiber-reinforced polymers: A review.”, *Functional Composites and Structures* 3.2 (2021): 022001.
2. **Wonvin Kim,** Su Hyun Lim, Hyunsoo Hong, Kwang Il Jeong, Seung Yoon On, Seongyeon Park, Jun Il You, Seong Su Kim*, “Optimum boundaries for maximum load-carrying capacity in water-lubricated composite journal bearings incorporating turbulences and inertial effects based on elastohydrodynamic analysis”, *Journal of Computational Design and Engineering* 9.6 (2022): 2506-2523. (< JCR 10%)
3. On, Seung Yoon, Hyemi Moon, Seong Yeon Park, Tae Woong Ohm, **Wonvin Kim**, Hyunsoo Hong, and Seong Su Kim. “Design of periodic arched structures integrating the structural nonlinearity and band gap effect for vibration isolation.” *Materials & Design* 224 (2022): 111397.
4. Hyunsoo Hong, Kwang Il Jeong, **Wonvin Kim**, Hyeonseong Jo, Seung Yoon On, Jae-moon Jeong, Seong Su Kim*, “Multifunctional composite spring capable of self-energy harvesting based on triboelectricity for exoskeleton robots”, Transactions of the Korean Society of Mechanical Engineers, 2023, A,47(5),465-469.
5. Jeong, Kwang Il, Su Hyum Lim, Hyunsoo Hong, Jae-Moon Jeong, **Wonvin Kim**, and Seong Su Kim. “Enhancing Vanadium redox flow batteries performance through local compression ratio adjustment using stiffness gradient carbon felt electrodes.” *Applied Materials Today* 35 (2023): 101928.
6. Hong, Hyunsoo, Kwang Il Jeong, Seung Yoon On, **Wonvin Kim**, and Seong Su Kim. “Structural optimization of an arch-structured epoxy/rubber composite vibration isolator using deep Q-value neural

network reinforcement learning." *Composite Structures* 323 (2023): 117506.

7. Hyunsoo Hong, Samuel Kim, **Wonvin Kim**, Wonki Kim, Jae-moon Jeong, Seong Su Kim*, "Kirigami-inspired composite metastructure for low-frequency vibration reduction", Composites Research, 2024; Vol. 37, No. 4, 291-295.
8. Hyeonseong Jo, Sangyoon Bae, Hyunsoo Hong, **Wonvin Kim**, Seong Su Kim*. "Prediction of transverse permeability in representative volume elements with closely arranged fibers through the application of delaunay-triangulation and electrical-circuit analogy" *Composite structure* 334 (2024), 117984.
9. Seung Yoon On, Seong Yeon Park, **Wonvin Kim**, and Seong Su Kim*, "Bimodal coaxial fiber sensor for simultaneous strain and temperature sensing for composite manufacturing process", *Composites Science and Technology*, 251 (2024), 110552.
10. Hyunsoo Hong, Wonki Kim, **Wonvin Kim**, Jae-moon Jeong, Samuel, and Seong Su Kim*, "Machine Learning-Driven Design Optimization of Buckling-induced Quasi-Zero Stiffness Metastructures for Low-Frequency Vibration Isoliation", *ACS Applied Materials & Interfaces*, 2024.
11. Su Hyun Lim, **Wonvin Kim**, Wonki Kim, Doyun Jeon, Seong Su Kim*, "Schematic construction of carbon fiber tow microstructure models and their effect on tensile strength of carbon fiber tow/epoxy composites: Quantification of carbon fiber distribution, misalignment, and interlacing", *Composites Science and Technology*, 2024;256:110786.
12. **Wonvin Kim,** Su Hyun Lim, Hyunsoo Hong, Dajeong Kang, Wonki Kim, Seung Yoon On, Haeun Lee, Sangyoon Bae, Seong Su Kim*, "Exploring Turbulence and Elastic Deformation: Novel Insights into Dynamic Instability in Water-lubricated Composite Journal Bearings for Hub-type Rim-driven thrusters" *Friction* (2024). (< JCR 5%)
13. Raja, Mohamad A., Wonki Kim, **Wonvin Kim**, Su Hyun Lim, and Seong Su Kim*. "Computational Micromechanics and Machine Learning-Informed Design of Composite Carbon Fiber-Based Structural Battery for Multifunctional Performance Prediction." *ACS Applied Materials & Interfaces* (2025).
14. Samuel Kim, Hyunsoo Hong, Jaemoon Jeong, **Wonvin Kim**, Wonki Kim, Gyumin Sim, Jieun Lee, and Seong Su Kim*. "Optimization of 3D printed truss meta-structure for structural performance and switchable vibration attenuation." *Composites Part A: Applied Science and Manufacturing* (2025): 108845.
15. Hyunsoo Hong, Samuel Kim, **Wonvin Kim**, Wonki Kim, Jae-moon Jeong, and Seong Su Kim*. "Design optimization of 3D printed kirigami-inspired composite metamaterials for quasi-zero stiffness using deep reinforcement learning integrated with bayesian optimization." *Composite Structures* (2025): 119031.
16. **Wonvin Kim**, Su Hyun Lim, Wonki Kim, Donghyeon Cho, Kiyaranu Putra Pakartiwan, Samuel Kim, Dajeong Kang, Ha Eun Lee, Sangyoon Bae, Seong Su Kim*. "Compliant composite journal bearings for water lubrication: Functional design strategies under misalignment and turbulence", *Composite Structures*, Volume 342 (2025), 119744. (< JCR 5%)

AWARD AND SCHOLARSHIP

- **Best Paper Award**, "Optimization of composite material properties to improve load-bearing capacity of water-lubricated composite journal bearings", **Wonvin Kim**, Seong Su Kim, the Korean Society for composite materials (KSCM) fall conference (2020)
- **Best Paper Award,** "An optimum boundary for maximum load-carrying capacity in misaligned water-lubricated composite bearing based on elastohydrodynamic analysis", **Wonvin Kim**, Su Hyun Lim, Gyumin Sim, Donghyeon Jo, Seong Su Kim, Tribology and Lubricants fall conference (2024)
- **Best Paper Award,** "An Investigation on the Validity of Isothermal and Dynamic Differential Scanning Calorimetry in Modeling the Curing Kinetics of Epoxy/Alumina Composites", Kiyaranu Putra Pakartiwan, Sangyoon Bae, Jaeyoung Jo, **Wonvin Kim**, Seong Su Kim - The Korean Society for Composite Materials (KSCM) Fall Conference 2024.
- **Best Paper Award,** "Development of Solid Polymer Electrolyte–Based Carbon Fiber Structural Battery Composites and Their Multifunctional Performance Prediction", Mohamad A. Raja, Su Hyun Lim, Wonki Kim, **Wonvin Kim**, Junho Lee, Seong Su Kim – The Korean Society for Composite Materials (KSCM) Spring Conference 2025.

PATENTS

Domestic (South Korea)

1. "Plastic resin composite comprising metal oxide nanorod and pretreating method of the same", Korea Patent Registered No. 10-2549188.
2. "Plastic resin composite comprising silane and pretreating method of the same" Korea Patent Registered No. 10-2617911.
3. "Closed-cell thermoelectric foam", Korea Patent Registered No. 10-2727629.

International

1. "Composite spring capable of self-triboelectric energy harvesting," US Patent Registered No. 11,695,351 B2.

2. "Dual-mode coaxial fiber-type sensor capable of simultaneous measurement of temperature and strain, method for manufacturing the sensor and system for measurement using the sensor", Japan Patent Registered No. 7789417.

CONFERENCE PROCEEDINGS (International)

1. **Wonvin Kim** and Seong Su Kim, "A Study of Elastohydrodynamic Lubrication for the Water-lubricated Composite Journal Bearing", 2nd Korea-Tribology International Symposium, Seoul, Korea, 2020.11

2. Su Hyun Lim, **Wonvin Kim**, Seong Su Kim. "Tensile strength of carbon fiber tow/epoxy composites with respect to the microstructure of carbon fiber tow", 20th European Conference on Composite Materials – ECCM20, Lausanne, Switzerland.

3. **Wonvin Kim** and Seong Su Kim, "Optimization of the material properties of the composites for load-carrying capacity in water-lubricated journal bearings", 24th International Conference on Composite Structures-ICCS24, Porto, Portugal, 2021.06.

4. Su Hyun Lim, **Wonvin Kim**, Seong Su Kim*, "Tensile strength of carbon fiber tow/epoxy composites with respect to the microstructure of carbon fiber tow", 20th European Conference on Composite Materials – ECCM20, Lausanne, Switzerland.

5. **Wonvin Kim** and Seong Su Kim, "3D BULK CLOSED-CELL THERMOELECTRIC FOAM FOR STRUCTURAL ELEMENTS OF A LARGE ENERGY HARVESTING SYSTEM", 2023 International Conference on Composite Materials – ICCM23, Belfast, United Kingdom, 2023.08.

6. **Wonvin Kim** and Seong Su Kim, "Transition of the instability behavior in water-lubricated composite journal bearing systems", 9th International Conference on Mechanics of Composites – Mechcomp9, Porto, Portugal, 2024. 06.

7. **Wonvin Kim**, Su Hyun Lim, Hyunsoo Hong, Jingyao Dai, Luiz Acauan, Brian L. Wardle, and Seong Su Kim, "HORIZONTALLY ALIGNED MWCNT/PEDOT:PSS THERMOELECTRIC COMPOSTIE FILMS", 21st European Conference on Composite Materials, Nantes, France, 2024. 07.

8. Muhammad Salman Sarfraz, Sangyoon Bae, **Wonvin Kim**, Seong Su Kim*. "Multi-physics modeling for composite processing and optimization for thick and multi-directional prepregs", The 27th International Conference on Composite Structures – ICCS27, Ravenna, Italy.

9. **Wonvin Kim**, Seong Su Kim, "Exploring Turbulence and Elastic Deformation: Novel Insights into Dynamic Instability in Water-lubricated Composite Journal Bearings", 11th Joint Ocean Eng. Symposium of SJTU, U_Tokyo, and KAIST, Shanghai, China, 2024. 10.

10. Donghyeon Cho, **Wonvin Kim**, Wonki Kim, Jaeyoung Jo, Seong Su Kim, "Fabrication of an Ultra-Thin Fiber-Type Sensor for Deformation Measurement During Underfill Curing Process", 22nd International Symposium on Microelectronics and Packaging joined with the 18th International Conference Reliability and Stress-Related Phenomena in Nanoelectronics (ISMP-IRSP), Busan, Korea.

11. Gyumin Sim, **Wonvin Kim**, Suhyun Lim, Samuel Kim, Jieun Lee, Seong Su Kim," Investigating Infiltration Time and Void Formation in Nanofiller-Based Underfill Materials for Semiconductor Applications", 22nd International Symposium on Microelectronics and Packaging joined with the 18th International Conference Reliability and Stress-Related Phenomena in Nanoelectronics (ISMP-IRSP 2024), Busan, Korea.

12. **Wonvin Kim**, Su Hyun Lim, Wonki Kim, Donghyeon Cho, Kiyaranu Putra Pakartiwan, Muhammad Salman Sarfraz, Seong Su Kim*. "Optimum boundaries for maximum load-carrying capacity for misaligned water-lubricated composite journal bearing based on elastohydrodynamic lubrication", 2025 International Conference on Composite Materials – ICCM24, Baltimore, United States, 2025. 08.

13. Su Hyun Lim, **Wonvin Kim**, Wonki Kim, Seong Su Kim*, "Friction behaviors of carbon fiber tows and their effect on the manufacturability and mechanical properties of composite pressure vessels", 24th International Conference on Composite Materials – ICCM24, Baltimore, USA, 2025. 08.

14. **Wonvin Kim**, Donghyeon Cho, Kiyaranu Putra Parkatiwan, Su Hyun Lim, Michal Lutyk, Seong Su Kim, "Exploring Turbulence and Elastic Deformation: Novel Insights into Dynamic Instability in Water-lubricated Composite Journal Bearings", 12th Joint Ocean Eng. Symposium of SJTU, U_Tokyo, and KAIST, Tokyo, Japan, 2025. 09.

15. Muhammad Salman Sarfraz, Min Geun Lee, Ha Eun Lee, **Wonvin Kim**, Dajeong Kang, Abdalla Ahmed, Seondo Lee, Seong Su Kim*. "Development of Low-Viscosity, High-Thermal-Conductivity Capillary Underfills for Advanced Chip Packaging", The 23rd International Symposium on Microelectronics and packaging (ISMP 2025), Daegu, Korea, 2025. 11.

16. **Wonvin Kim**, Su Hyun Lim, Donghyeon Cho, Jeeeun Lee, Wonki Kim, Kiyaranu Putra Pakartiwan, Michal Lutyk, and Seong Su Kim*. "Functional design strategies for misaligned water-lubricated composite journal bearings incorporating turbulence under elastohydrodynamic conditions", The 3rd China-Korea-Japan Joint Symposium on Composite Materials, Guangzhou, China, 2025. 11.

CONFERENCE PROCEEDINGS (Domestic)

1. **Wonvin Kim**, Su Hyun Lim, Wonki Kim, Hyeonseong Jo, Mohamad Raja, Seong Su Kim*, "A study of the water-lubricated composite journal bearing including the turbulence, inertial effect, and the elastic deformation of the composite", 72nd conference on Tribology and Lubricants, Jeju-do, South of Korea, 2022. 04.
2. **Wonvin Kim**, Wonki Kim, Hyeonseong Jo, Seong Su Kim*, "Development of the thermoelectric foam for energy harvesting in a large insulation system" the Korean Society for composite materials (KSCM) fall conference, 2021. 11.
3. **Wonvin Kim**, Wonki Kim, Seong Su Kim*, "Development of the 3D bulk micro-foam thermoelectric material for large energy harvesting system, the Korean Society of Mechanical Engineers, 2021. 10.
4. **Wonvin Kim**, Seong Su Kim*, "Optimization of composite material properties to improve load-bearing capacity of water-lubricated composite journal bearings" the Korean Society for composite materials (KSCM) fall conference, 2020. 11.
5. **Wonvin Kim**, Seong Su Kim*, "A study of Elastohydrodynamic lubrication for the water-lubricated composite journal bearing", 69th conference on Tribology and Lubricants, Daejeon, South of Korea, 2020. 09.

6. **Wonvin Kim,** Su Hyun Lim, Hyunsoo Hong, Seong Su Kim*, “수윤활 저널 베어링 시스템의 동적 계수를 통한 안정성 분석”, 2023 년도 한국트라이볼로지학회 제 74 회 추계학술대회.
7. **Wonvin Kim,** Su Hyun Lim, Hyunsoo Hong, Seong Su Kim*, “수윤활 저널 베어링 시스템의 동적 불안정성 분석”, 2023 년도 대한기계학회 추계학술대회.
8. **Wonvin Kim**, Su-Hyun Lim, Hyunsoo Hong, Muhammad Salman Sarfraz, Gyumin Sim, Mingeun Lee, Seong Su Kim*, “Instability analysis of the water-lubricated composite journal bearing system”, the Korea Society for Mechanical Engineers, 2024. 04.
9. **Wonvin Kim**, Su-Hyun Lim, Hyunsoo Hong, Muhammad Salman Sarfraz, Gyumin Sim, Mingeun lee, Seong Su Kim*, “A study of system stability of the water-lubricated composite journal bearing system incorporating the turbulence and the elastic deformation of the bearing liner”, the 75th Spring Conference of the Korean Tribology Society, 2024. 04.
10. **Wonvin Kim**, Su-Hyun Lim, Hyunsoo Hong, Muhammad Salman Sarfraz, Gyumin Sim, Mingeun lee, Seong Su Kim*, “Design guidelines of the water-lubricated composite journal bearing system for the system stability and maximum load-carrying capacity”, The 2024 Spring Conference of the Korean Society of Precision Engineering, 2024. 05.
11. Muhammad Salman Sarfraz, Sangyoon Bae, **Wonvin Kim**, Seong Su Kim*, “Multi-physics processing and optimization of thick, and multi-directional carbon fiber prepregs” The 2024 Spring Conference of the Korean Society for Mechanical Engineers.
12. Su Hyun Lim, **Wonvin Kim**, Jieun Lee, Junho Lee, Nils Maximilian Demski, Holger Seidlitz, Seong Su Kim*, “Study on microstructure model construction of carbon fiber tow and their effect on tensile strength of carbon fiber tow/epoxy copmosites”, The 2024 Fall conference of the Korean Society of Composite Materials.
13. **Wonvin Kim**, Su Hyun Lim, Gyumin Sim, Donghyeon Jo, Seong Su Kim*, “An optimum boundary for maximum load-carrying capacity in misaligned water-lubricated composite bearing based on elastohydrodynamic analysis” the 76th Fall Conference of the Korean Tribology Society, 2024. 10.
14. **Wonvin Kim**, Gyumin Sim, Donghyeon Jo, Kiyaranu Putra Pakartiwan, Yitro Samuel Aditya, Seong Su Kim*, “A study of Dynamic Stability of Water-lubricated Composite Journal Bearings in Rim-driven thrusters”, The 2024 Fall Conference of the Korea Society of Marine Engineering, 2024, 10.
15. Kiyaranu Putra Pakartiwan, Sangyoon Bae, Jaeyoung Jo, **Wonvin Kim**, Seong Su Kim*, "An Investigation on the Validity of Isothermal and Dynamic Differential Scanning Calorimetry in Modeling the Curing Kinetics of Epoxy/Alumina Composites" The 2024 Fall Conference of the Korean Society of Composite Materials.
16. Su Hyun Lim, **Wonvin Kim**, Jieun Lee, Junho Lee, Nils Maximilian Demski, Holger Seidltiz, Seong Su Kim*, “Study on microstructure model construction of carbon fiber tow and their effect on tensile strength of carbon fiber tow/epoxy composites”, The 2024 Fall Conference of the Korean Society of Composite Materials.
17. Wonki Kim, **Wonvin Kim**, Su Hyun Lim, Junho Lee, Jongin Park, Seong Su Kim*. "Analysis of the Mechanical Properties of Triaxial Braided Composites Based on its Geometrical model" The 2025 Spring Conference of the Korean Society for Composite Materials.
18. Wonki Kim, **Wonvin Kim**, Su Hyun Lim, Sangyoon Bae, Jaeyoung Jo, Donghyeon Cho, Seung Min Jeong, Ye Jin Kim, Jin Sung Kim, Seong Su Kim*. "Effects of Image Size and Variable Changes on the Cover Factor of Triaxial Braided fabrics" The 2025 Spring Conference of The Korean Society of Propulsion Engineers.
19. **Wonvin Kim**, Wonki Kim, Su Hyun Lim, Donghyeon Jo, Kiyaranu Putra Pakartiwan, Seong Su Kim*, “Behavior of Optimum Boundaries for Maximum Load-carrying Capacity in Misaligned Water-lubricated Composite Journal Bearings Including Turbulence based on Elastohydrodynamic Lubrication”, the 77th Spring Conference of the Korean Tribology Society, 2025. 03.
20. **Wonvin Kim**, Su Hyun Lim, Wonki Kim, Donghyeon Jo, Kiyaranu Putra Pakartiwan, Mingeun Lee, Jongin Park, Seong Su Kim*, “An Optimum Boundary for Maximum Load-carrying Capacity in Misaligned Water-lubricated Composite Journal Bearings”, The 2025 Spring Conference of the Korean Society of Composite Materials.
21. **Wonvin Kim**, Su Hyun Lim, Donghyeon Jo, Kiyaranu Putra Pakartiwan, Wonki Kim, Seong Su Kim*, “Optimum boundaries for maximum load-carrying capacity of misaligned water-lubricated composite journal bearings in Rim-driven thrusters”, The Spring Conference of the Korean Society of Propulsion Engineers.
22. **Wonvin Kim**, Su Hyun Lim, Wonki Kim, Donghyeon Jo, Kiyaranu Putra Pakartiwan, Michal Lutyk, Seong Su Kim*, “Tailored Design Envelop Incorporating Compliance and Turbulence in Water-lubricated Composite Journal Bearing”, 78th Fall conference of the Korean Tribology Society, 2025. 10.
23. Junho Lee, **Wonvin Kim**, Su Hyun Lim, Haeun Lee, Samuel Kim, Jong in Park, Seon do Lee, and Seong Su Kim*,

"Honeycomb Structural Batteries to Overcome the Trade-off between Mechanical and Electrochemical Performance in Electrolytes", The 2025 Fall Conference of the Korean Society for Composite Materials, 2025. 11.

24. Michal Lutyk, **Wonvin Kim,** Samuel Kim, and Seong Su Kim*, "Pareto-Optimized Buckling-Induced Quasi-Zero Stiffness Structure for Vibration Attenuation and Energy Harvesting via Reinforcement Learning", The 2025 Fall Conference of the Korean Society for Composite Materials, 2025. 11.
25. Su Hyun Lim, **Wonvin Kim**, Wonki Kim, Jeeeun Lee, Kiyaranu Putra Pakartiwan, Jaeyeong Jo, and Seong Su Kim*, "Effect of Multi-Scale Behavior of Carbon Fiber Tow on the Manufacturing Quality of Filament-Wound Composite Cylinders", The 2025 Fall Conference of the Korean Society for Composite Materials, 2025. 11.
26. Su Hyun Lim, **Wonvin Kim**, Wonki Kim, Jeeeun Lee, Kiyaranu Putra Pakartiwan, Jaeyeong Jo, and Seong Su Kim*, "Effect of Fiber Bed Compaction Behavior on the Mechanical Performance of Filament-Wound Composite Cylinders," The 78th Fall Conference of the Korean Tribology Society, 2025. 10.

RESEARCH EXPERIENCE

FE analysis of the static composite journal bearing (UDM)

- Modeled the static composite journal bearings for structural analysis during operation
- Conducted the failure analysis under both the static and dynamic loads

Analysis of the bolted joint (Hanon system)

- Modeled the bolted composite joints to prevent the self-loosening under the thermal loads
- Revealed causes of the self-loosening in the bolted composite joints both experimentally and analytically
- Developed the new design of the bolt to prevent the self-loosening

Analysis of the water-lubricated composite journal bearing (KERI)

- Developed the in-house code with MATLAB for the water lubrication analysis
- Derived the dynamic properties for water lubrication including the turbulence
- Conducted the elastohydrodynamic lubrication analysis for water-lubricated composite journal bearing including the turbulence and inertial effect
- Constructed the design guideline for water-lubricated composite journal bearing
- Suggested the optimal boundary for maximum load-carrying capacity in water-lubricated journal bearing system

Development of the lightweight materials for LG cordless vacuum cleaner (LG electronics)

- Fabricated the lyocell fiber reinforced thermoplastic polymers
- Developed the surface treatment with silane coupling agent and zinc oxide to improve the interfacial strength in composites
- Developed the pre-impregnated chopped lyocell fiber with solvent treatment for enhancing the better dispersion in manufacturing the composite
    - Filed 2 patents for the pretreatment with silane coupling agents and zinc oxide to improve the compatibility between the fibers and thermoplastic

Analysis of the thermoelectric foam (Korea Shipbuilidng & Offshoe Engineering)

- Developed a new way to improve thermoelectric properties of thermoelectric polymer with structural and material design

- Developed a new way to fabricate the closed-cell thermoelectric foam, which has the high mechanical and thermoelectric properties

    - Filed 1 patent for the closed-cell thermoelectric foam

Analysis of the thermoelectric composite film (Co-work w/ MIT)

- Developed a horizontally aligned carbon nanotube / PEDOT:PSS composite film

Development of water-lubricated composite journal bearing system in high-voltage shaft generator (KEIT)

- Developed a water-lubricated composite journal bearing system considering turbulence, inertial effect, and bearing liner deformation in both steady and dynamic state

Development of water-lubricated composite journal and thrust bearing system in the rim-driven thrusters (MOF)

- Developed a water-lubricated composite journal and thrust bearing system considering turbulence, misalignment effect, and bearing liner deformation in steady state

Consolidation in composite manufacturing process

- Measured the resin pressure during consolidation in composite manufacturing process
- Construction of the new model to describe the consolidation process

Carbonized wood-based anode for lithium-ion battery

- Developed a Si-C reinforced Carbonized wood anode as a structural battery for lithium-ion battery

TECHNICAL SKILLS

Program language	MATLAB, Python, C
Software	ABAQUS
Experimental Skills	- Composite Manufacturing: compression molding, foaming - Machining: milling, grinding machine, polishing, drilling, laser cutting - Adhesion: surface treatment, particle embedding, bonding - Material testing: tension, compression, bending, impact, single lap joint - Thermoelectricity: Seebeck coefficient, Electrical conductivity - Cell test: Cell test (Cyclic voltammetry, EIS, Cyclic test, Charge-Discharge test) - Measurement: SEM, OM, DSC