

Curriculum Vitae

Sangjun Jeon, Ph. D.

Hyundai-NTU-A*STAR Corporate Lab, School of Mechanical and Aerospace Engineering, Nanyang Technological University,
#N3.2-B1-02, 65 Nanyang Drive, Singapore, 637460
Phone: +82-10-7130-9354
Email: sangjun.jeon@ntu.edu.sg

KEY MESSAGES

By delving deep into the intersection of materials science and sustainable manufacturing processes, my research aims to drive a paradigm shift in how we conceive, produce, and utilize products in society.

REARCH INTERESTS

- **Developing next-generation sustainable manufacturing through advanced manufacturing, materials, and AI.**
 - **Recycling and Remanufacturing:** Advancement in the design and development of materials that can be fully recycled or reused, thereby promoting a circular economy in the manufacturing sector.
 - Development of recycling technologies for advanced composite materials (ex., chemical recycling and microwave pyrolysis for end-of-life CFRP)
 - Remanufacturing processes using additive manufacturing techniques (ex., Remanufacturing rCFRP via MEX)
 - **AI-Driven Materials Processing:** Investigating machine learning and data-driven approaches for process optimization and mechanical property prediction in advanced manufacturing.
 - AI-based prediction of complex process effects in various manufacturing processes (ex., sintering-aging combined effects in metal material extrusion)
 - Process parameter optimization for tailoring mechanical properties (ex., AM-fabricated Component)
 - **Advanced Manufacturing:** Developing innovative manufacturing techniques and hybrid structures to improve material performance and manufacturing efficiency.
 - Novel material systems and hybrid structures (ex., metal-polymer hybrid structures, bulk metallic glasses fabrication)
 - Advanced pretreatment and post-treatment methods (ex., isostatic treatment for enhanced interlayer bonding, surface modification for improved adhesion)
 - Design complexity-driven manufacturing strategies (ex., production efficiency optimization for complex geometries)
 - **Novel Material Characterization:** Developing advanced characterization methods to evaluate material properties and performance under various conditions for sustainable manufacturing applications.
 - Performance characterization under extreme conditions (ex., fatigue behavior of recycled CFRP at elevated temperatures, Mechanical behavior of components exposed in hydrogen atmosphere)
 - Multi-scale material analysis and testing (ex., microstructure-property relationship in additive manufactured components using molecular dynamics)

EDUCATION

Present	Research Fellow, Hyundai-NTU-A*STAR Corporate Lab Nanyang Technological University, Singapore
Dec. 2025	Lecturer, Kongju National University, Cheonan, Republic of Korea
Aug. 2025	Ph. D. Future Convergence Engineering [Graduated at President's Doctoral Award] Kongju National University, Cheonan, Republic of Korea
Feb. 2022	M. S. Future Convergence Engineering Kongju National University, Cheonan, Republic of Korea
Aug. 2020	B. S. Mechanical and Automotive Engineering [Graduated at the top in College of Engineering] Kongju National University, Cheonan, Republic of Korea

RESEARCH AND TEACHING EXPERIENCES

TEACHING ASSISTANT (TA) (Feb. 2020 – Aug. 2025)

- Department of Mechanical and Automotive Engineering, Kongju National University, Cheonan, Korea
 - Assistance for professors with sophomore, junior, senior and master level courses by teaching classes, managing lab sessions, holding office hours, discussion sessions and grading reports, quizzes and homework.
 - Courses include: Capstone Design, Solid Mechanics, 3D CAD, R&D Planning, Mechanical Engineering Research
- Department of Advanced Sensor Convergence Device, Daejeon · Sejong · Chungnam Regional Innovation Platform
 - Assistance for professors with freshman and sophomore level courses by teaching classes, holding office hours and discussion sessions.
 - Courses include: Sensor Engineering (131001), Micro and Nano System (131009)

Visiting Ph.D. Student (Apr. 2024 - May. 2025)

- School of Mechanical and Aerospace Engineering, Nanyang Technological University **(2024.05~2025.05, Funded by Korea NRF)**
 - Research on recycling end-of-life CFRP products and remanufacturing of recycled Carbon Fiber Reinforced Plastic (rCFRP) via additive manufacturing to advance sustainable manufacturing practices.

Lecturer (Aug. 2025 – Dec. 2025)

- Department of Mechanical and Automotive Engineering, Kongju National University, Cheonan, Korea
 - Courses include: Mechanical Material Science and Engineering

EXTRA CURRICULAR ACTIVITIES

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| Aug. 2025 | The National University Development Project of the Ministry of Education |
| | <ul style="list-style-type: none"> • Position: Principal Investigator (Project Name: Development of an Integrated Process for Enhanced Mechanical Properties of Additively Manufactured CFRP using Recycled Carbon Fibers from End-of-Life Products) |
| Apr. 2024 | National Research Foundation (NRF) Grant- Outstanding Ph.D. student program |
| | <ul style="list-style-type: none"> • Position: Principal Investigator (Project Name: A Study on Material Characteristics of rCFRP with Additive Manufacturing for Sustainable Society) |
| Oct. 2023 | Living Lab Project: Social problem-solving project using technology in core areas (Daejeon · Sejong · Chungnam Regional Innovation Platform) |
| | <ul style="list-style-type: none"> • Position: Project Leader (Project Name: Manufacturing eco-friendly mobility components using recycled carbon fiber composites) • Through project management, product development planning, project planning, coordination, budgeting and resource allocation, and documentation. |
| Mar. 2023 | Living Lab Project: Social problem-solving project using technology in core areas (Daejeon · Sejong · Chungnam Regional Innovation Platform) |
| | <ul style="list-style-type: none"> • Position: Project Leader (Project Name: For the safety of the local community, developed an electric kickboard battery protector made from recycled carbon fibre reinforced plastic) • Through project management, product development planning, project planning, coordination, budgeting and resource allocation, and documentation. |
| Aug. 2022 | Carbon Start Up Hacker Road (Ministry of Trade, Industry and Energy & Korea Carbon Industry Promotion Agency) |
| | <ul style="list-style-type: none"> • Position: Project Leader (Project Name: Recycled carbon fiber undercover for electric vehicle batteries) • Through project management, product development planning, project planning, coordination, budgeting and resource allocation, and documentation. |
| Mar. 2022 | Local Talent Integration Clubs (Daejeon · Sejong · Chungnam Regional Innovation Platform) |
| | <ul style="list-style-type: none"> • Position: Club Leader • Through club management, project planning, coordination, budgeting and resource allocation, and documentation. |

HONORS AND AWARDS

Mar. 2026	Best Paper Award, Korean Society for Precision Engineering Conference (KSPE Autumn 2025)
Mar. 2026	Outstanding Paper Award, Korean Society of Manufacturing Process Engineers Conference (KSMPE 2025)
Aug. 2025	<u>President's Doctoral Award</u> , Konju National University (Awarded for outstanding doctoral achievements and research excellence)
Jul. 2025	<u>Best Paper Award</u> , International Conference on Precision Engineering and Sustainable Manufacturing (PRESM 2025, Paper title: AI-Based Mechanical Properties Prediction of Sintering-Aging Combined Effect in Metal-Material Extrusion, <u>Invited Journal in International Journal of Precision Engineering Green-Tech</u>)
Jul. 2025	Outstanding Presentation Award, International Conference on Precision Engineering and Sustainable Manufacturing (PRESM 2025, Paper title: Paper title: Fatigue behavior of recycled CFRP at elevated temperatures)
Nov. 2024	Best Paper Award, Korean Society for Precision Engineering Spring Conference (KSPE Autumn 2024)
Nov. 2023	Outstanding Paper Award, Korean Society for Precision Engineering Spring Conference (KSPE Autumn 2023)
Dec. 2022	Outstanding Paper Award, Korean Society of Manufacturing Process Engineers Autumn Conference (KSMPE Autumn 2022)
Aug. 2022	Government Scholarship (Chungnam Institute for Human Resources Development)
Apr. 2022	Outstanding Paper Award, Korean Society of Manufacturing Process Engineers Spring Conference (KSMPE Spring 2022)
Oct. 2021	Outstanding Paper Award, Korean Society for Precision Engineering Spring Conference (KSPE Spring 2021)
2019~2021	Corporate Scholarship (KISWEL)
Nov. 2020	Corporate Scholarship (Korea Mech Const Constructors Association)
Aug. 2017	<u>Prime Minister's Prize</u> of Korea Youth Invention Idea Contest (Korean University Invention Association)
Aug. 2016	Government Scholarship (Cheonan-Si Scholarship Foundation)
Aug. 2015	Government Scholarship (Cheonan-Si Scholarship Foundation)

TECHNICAL SKILLS

Manufacturing:	CCFRP FDM Printer (Anisoprint, Markforged), IDEX FDM Printer (BCN3D), Compression Molding, Hot Press
Material characterization:	Drop Weight Machine (Instron), UTM (Shimatz, Instron, MTS), DSC, TGA, DMA, XRD, XPS, SEM, FT-IR, AFM, etc
Experimental equipment:	Cold Isostatic Pressure (Maximum 3000 Bar), Microwave Pyrolysis, Drying and Heating, Single Extruder (3DEVO Precision 350, 3Devo Composer 450)
Design and simulation:	Molecular Dynamics (MD simulation, Materials Square), COMSOL, CATIA, SolidWorks, Ansys, EDEM, AI-driven process optimization
Data analysis:	Minitab, Origin, MATLAB, MS Office

PROFESSIONAL CERTIFICATE

Mar. 2023	Analytical Technology and Manufacturing Practice for Improving the Anti-Radiation Properties of Carbon Composites (Korea Carbon Industry Promotion Agency)
Oct. 2022	Carbon Composite Property Evaluation Technology (Korea Carbon Industry Promotion Agency)
Aug. 2022	Hot Pressing and Molding for Mass Production (Korea Carbon Industry Promotion Agency)
Jun. 2022	Carbon Composite Manufacturing Using Thermoplastics (Korea Carbon Industry Promotion Agency)

Apr. 2021	Comsol Multi Physics Training: Fundamentals & Plasma (Altsoft)
Apr. 2021	Altair's Training: DEM Analysis and Optimization with Hyperworks (Altair)
Jan. 2020	Mathwork Training: MATLAB Fundamentals & Simulink for System and Algorithm Modeling (MathWorks)
Nov. 2019	Minitab Training: Fundamentals & DOE (Iretech)

PUBLICATIONS

1. **S. Jeon**, S. J. Park, S.K. Moon, and D. Yang*, "End-to-end processing of recycled carbon fiber composites: From waste hydrogen tanks to mechanically enhanced additive-manufactured components", *Chemical Engineering Journal*. (SCIE, IF: 13.5, JCR<3%)
2. **S. Jeon**, S. J. Park, S.K. Moon, and D. Yang*, "Enhanced mechanical properties and reduced anisotropy of material extrusion-manufactured short carbon fibre-reinforced plastic via cold isostatic pressing", *Virtual and Physical Prototyping*, 2025, e2499934. (SCIE, IF: 10.2, JCR<10%)
3. **S. Jeon**, J. Kim, S. J. Park, J.Y. Kim, S.K. Moon, and D. Yang*, "Temperature Dependent Mechanical Properties of End-of-Life Carbon Fiber Reinforced Plastics", *International Journal of Precision Engineering and Manufacturing-Green Technology*, 2025. (SCIE, IF: 5.6, JCR<10%)
4. **S. Jeon**[#], J. Kim[#], A. Go, J.P. Choi, D. Yang* and S.K. Moon*, "AI-Based Mechanical Properties Prediction of Sintering-Aging Combined Effect in Metal-Material Extrusion", *International Journal of Precision Engineering and Manufacturing-Green Technology*, (Invited Paper via PRESM 2025 Best Paper Award). (SCIE, IF: 5.6, JCR<10%)
5. **S. Jeon**, J. Kim, and D. Yang*, "Design of Large-Scale Microwave Cavity for Uniform and Efficient Plastic Heating", *Polymers* 2022, 14, 541 (SCIE, IF: 4.0, Q1)
6. **S. Jeon**, Y. Kim, and D. Yang*, " Analysis of Powder Packing for Alumina Using Design of Experiment with Mixture and Vibration " *Composites Research* 2021, 34, 330-336 (SCIE, IF: 0.4, Q4)
7. **S. Jeon**[#], A. Go[#], D. Kim, S. K. Moon*, S. J. Park*, "Intelligent process control and stimulus-responsive 4D transformation in extrusion-based 3D food printing: A critical review", *International Journal of Bioprinting*, (SCIE, IF: 6.0).
8. J.Kim, **S. Jeon**, S. J. Park, and S.K. Moon*, "A data-efficient machine learning approach for amorphous Fe-based bulk metallic glass fabrication in powder bed fusion", *International Journal of AI for Materials and Design*.
9. J. Lee, S. J. Park, J.P. Choi, **S. Jeon**, S.K. Moon*, "Design Complexity-Driven Optimization of Production Efficiency and Scheduling for Metal-Polymer Hybrid Structures in Additive Manufacturing", *International Journal of Precision Engineering and Manufacturing-Green Technology*, (SCIE, IF: 5.6, JCR<10%).
10. S. J. Park, S. Cho, P.H. Nicholas Ng, J. Lee, J. Kim, **S. Jeon**, and S.K. Moon*, "Insights into the industrial applications and future directions of bulk metallic glasses via additive manufacturing", *IJPEM* (SCIE, IF: 3.6).
11. S. J. Park, S. Cho, **S. Jeon**, and S.K. Moon*, "A Representative Volume Element-Based Approach for Predicting Sintering Shrinkage in Metal Binder Jetting", *International Journal of Precision Engineering and Manufacturing-Green Technology*, (SCIE, IF: 5.6, JCR<10%)

UNDER REVIEW and Submitted PAPERS (: available upon request)**

1. **S. Jeon**, S.K. Moon, and D. Yang*, “End-of-Life Carbon Fiber Reinforced Plastic Recycling and Cold Isostatic Pressing for Enhanced 3D-Printed Composites”, *Composites Structure (Under Review)*. (JCR<5%)
 2. **S. Jeon**, J. Kim, J.P. Choi, D. Yang* and S.K. Moon*, “Recycling and Remanufacturing of CFRP for Additive Manufacturing and Its Applications: A Critical Review”, *International Journal of Precision Engineering and Manufacturing-Green Technology, (Invited Paper)*. (SCIE, IF: 5.3, JCR<10%)
 3. S. J. Park, **S. Jeon**, P.H. Nicholas Ng, and S.K. Moon*, “Additive manufacturing of FeCrBSiC bulk metallic glasses: Toward exploration of process parameters and trabecular-inspired hybrid structures”, *Progress in Additive Manufacturing, (Under Review)*.
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Technical Transfer

1. **S. Jeon**, D. Yang*, “Optical Method for Chemical Contamination Visualization and Analysis”, **\$3,550**

WORKING PAPERS (: available upon request)**

1. [Sustainability] **S. Jeon**, Y. Kim, J.Y. Kim*, D. Yang*, “Enhancing Mechanical Properties of Recycled Carbon Fiber Composites from Waste Hydrogen Tanks through Surface Modification” (**)
2. [AI-Driven Materials Processing] **S. Jeon**, J. Kim, S.K. Moon, D. Yang*, “Machine Learning-based Process Optimization for Tailoring Mechanical Properties of Material Extrusion-fabricated Recycled Carbon Fiber Reinforced Plastic” (**)
3. [Advanced Manufacturing] **S. Jeon**, Y.W. Kim, S.K. Moon* and D. Yang*, “Enhanced Mechanical Properties of Material Extrusion-Manufactured Continuous Carbon Fiber-Reinforced Thermo-Thermoset Plastic via Isostatic Pressing: Experimental and Molecular Dynamic Study”

INTERNATIONAL CONFERENCE PRESENTATIONS

1. **S. Jeon**, J. Kim S.K. Moon*, and D. Yang*, “Machine Learning-based Process Optimization for Tailoring Mechanical Properties of Material Extrusion-fabricated Recycled Carbon Fiber Reinforced Plastic”, International Conference on Future of AM Aug 5-7, 2025, Singapore.
2. **S. Jeon**, J. Kim, A. Go, J.P. Choi, D. Yang* and S.K. Moon*, “AI-based Mechanical Properties Prediction of Sintering-aging Combined Effect in Metal-material Extrusion”, International Conference on Precision Engineering and Sustainable Manufacturing (PRESM 2025), Jul 6-11, 2025, Chiang Mai, Thailand. **[Best Paper Award]**
3. **S. Jeon**, S.K. Moon, Y. Kim, and D. Yang*, “Fatigue Characteristics of Recycled Carbon Fiber Reinforced Plastic at Elevated Temperatures”, International Conference on Precision Engineering and Sustainable Manufacturing (PRESM 2025), Jul 6-11, 2025, Chiang Mai, Thailand. **[Outstanding Presentation Award]**
4. J. Lee, S.K. Moon*, S. J. Park, J.P. Choi, **S. Jeon**, and J. Kim, “Design Complexity-driven Optimization of Production Efficiency and Scheduling for Metal-polymer Hybrid Structures in Additive Manufacturing”, International Conference on Precision Engineering and Sustainable Manufacturing (PRESM 2025), Jul 6-11, 2025, Chiang Mai, Thailand.

5. **S. Jeon**, S.K. Moon and D. Yang*, “Mechanical properties of 17-4 PH stainless steel fabricated via metal material extrusion under sintering and aging conditions”, 6th International Conference on Manufacturing Process & Technology 2025, Feb 10-13, 2025, Bali, Indonesia.
6. **S. Jeon**, S.K. Moon and D. Yang*, “Enhancing Mechanical Properties of reclaimed Carbon Fiber Reinforced Plastic Fabricated Material Extrusion via Cold Isostatic Pressing”, IEEE International Conference on Industrial Engineering and Engineering Management (IEEM 2024), Dec 15-18, 2024, Bangkok, Thailand.
7. **S. Jeon**, C. Lee, and D. Yang*, “Mechanical Analysis of Recycled Carbon Fiber Composites from Waste Hydrogen Tanks”, Europe-Korea Conference on Science and Technology (EKC 2023), Aug 14-18, 2023, Munich, Germany.
8. **S. Jeon**, D. Yang, and Y. Ko, “Recovering Carbon Fiber from Carbon-fiber-reinforced Polymers by Microwave Irradiation”, International Symposium on Precision Engineering and Sustainable Manufacturing (PRESM 2022) Jul 20-22, 2022, Seogwipo, Republic of Korea.
9. D. Yang and **S. Jeon**, “Fabrication of Tattoo Paper-Based SERS Devices and Pesticides Sensing on Fruit Surfaces”, The 49 Years Materials Research Society Spring Meeting & Exhibit (MRS Spring 2022), May 23-25, 2022, Honolulu, USA
10. D. Lee, H. Lee, D. Yang, K. Lee, and **S. Jeon**, “A Study on the Locomotive Advantages of a Multi-Modular Helical Magnetic Millirobot in Curved and Narrow Blood Vessels”, 2022 Joint MMM-Intermag Conference (INTERMAG) Jan 10-14, 2022, New Orleans, USA.
11. D. Yang, H. Kim, M. Ko, J. Kim, **S. Jeon**, and D. Lee, “Fabrication of Tattoo-Type Surface-Enhanced Raman Scattering (SERS) Substrate for Chemical Sensing”, The 6th International Conference on Advanced Electromaterials (ICAE 2021) Nov 9-12, 2021, Jeju, Republic of Korea.
12. **S. Jeon**, D. Yang, and D. H. Kim, “Analysis of Mixing Performance according to RPM and Particle Size of Plough for Ploughshare Mixer”, International Symposium on Precision Engineering and Sustainable Manufacturing (PRESM 2021), Jul 21-23, 2021, Jeju, Republic of Korea.
13. **S. Jeon**, J. Kim, H. Lee, and D. Yang, “Experimental Drying Characteristics of Polymer Pellets using Microwave”, International Symposium on Precision Engineering and Sustainable Manufacturing (PRESM 2020), Nov 15-18, 2020, Virtual.
14. H. Lee, D. Yang, K. Lee, and **S. Jeon**, “A Two-Dimensional Magnetic Gripper Robot Driven by a Triad of Electromagnetic Coils”, The 65th Annual Conference on Magnetism and Magnetic Materials (MMM 2020), Nov 2-6, 2020, Virtual.