

Gihyeon Jeon

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RESEARCH INTERESTS

Tomography	Computerized Tomography, Conical Radon Transform, Photoacoustic Tomography
Scientific Machine Learning	(Blind) Inverse Problems, PDE solvers (Physics-Informed Neural Network, DeepONet), Generative Models (for Materials Design)
Materials Design	Machine Learning Interatomic Potentials, Crystal Structure Prediction, Inverse Design

EDUCATION & EMPLOYMENT

2025.03. - Present	Postdoctoral Researcher, Computational Science Research Center, Korea Institute of Science and Technology (KIST)
2021.03. - 2025.02.	Ph.D. in Mathematics , Kyungpook National University
2019.03. - 2021.02.	M.S. in Mathematics , Kyungpook National University
2012.03. - 2019.02.	B.S. in Physics with a Minor in Mathematics , Kyungpook National University
Military Service, 2013.04 - 2015.01	

PUBLICATIONS

1: first author, †: corresponding author

Journal articles

- [1] **Gihyeon Jeon**¹ and Gyeongha Hwang. “SelfPAT: Self-supervised joint estimation of sound speed and initial pressure in PAT” (Submitted).
- [2] **Gihyeon Jeon**¹, Nyan Htet Naing¹, and Gyeongha Hwang. “SelfPMRI: Self-supervised joint sensitivity maps estimation and image reconstruction in parallel MRI” (Submitted).
- [3] Gyeongha Hwang, **Gihyeon Jeon**[†], Sunghwan Moon, and Dabin Park[†]. “Implicit learning to determine variable sound speed and the reconstruction operator in photoacoustic tomography”. *Applied Mathematics in Science and Engineering* 34.1 (2026), p. 2661458.
- [4] Sanghyun Kim¹, **Gihyeon Jeon**^{1†}, Seungwoo Hwang, Jiho Lee, Jisu Jung, Seungwu Han, and Sungwoo Kang[†]. “Are diffusion models ready for materials discovery in unexplored chemical space?” *Patterns (Sister journal of Cell)* 7.6 (2026).
- [5] **Gihyeon Jeon**^{1†}. “Range description for an attenuated conical Radon transform with fixed central axis and opening angle”. *Applicable Analysis* 104.16 (2025), pp. 3278–3290.
- [6] Souvik Roy, **Gihyeon Jeon**, and Sunghwan Moon. “Radon transform with Gaussian beam: Theoretical and numerical reconstruction scheme”. *Applied Mathematics and Computation* 452 (2023), p. 128024.
- [7] **Gihyeon Jeon**¹ and Sunghwan Moon. “Singular value decomposition of the attenuated conical Radon transform with a fixed central axis and opening angle”. *Integral Transforms and Special Functions* 32.10 (2021), pp. 812–822.

Books

[1] **Gihyeon Jeon**¹ and Daesick Ryu¹. *Julia Programming: Computational Science, Statistical Analysis, Deep Learning, and Data Visualization (written in Korean, Korean title: 줄리아 프로그래밍: 수리 계산, 통계 분석, 딥러닝, 데이터 시각화를 위한)*. bjpublic, 2024. ISBN: 9791165922757.

Preprints

[1] Gyeongha Hwang, **Gihyeon Jeon**, and Sunghwan Moon. “Self-supervised learning for a nonlinear inverse problem with forward operator involving an unknown function arising in photoacoustic tomography”. *arXiv preprint arXiv:2301.08693* (2023).

TEACHING EXPERIENCE

Teaching

2024 Fall Calculus II (CLTR0212-021), Kyungpook National University
2024 Spring Calculus I (CLTR0211-040, CLTR0211-021), Kyungpook National University

Teaching Assistant

2025 Jan. Chief Assistant, 2025 Young Mathematician Camp, Korean Mathematical Society and Hyundai Motor Chung Mong-Koo Foundation
2022 Fall Seminar in Linear Algebra 1 (MATH0241-001), Kyungpook National University
2022 Spring Seminar in Linear Algebra 2 (MATH0242-001), Kyungpook National University
2019 Spring Mentorship for Undergraduate Students in Mathematics, Kyungpook National University

SKILLS

Computer Languages Julia-Flux, Python-Pytorch
Software and Tools BART (Berkeley Advanced Reconstruction Toolbox), MATLAB, L^AT_EX
Package Implementation TopologicalDataAnalysis.jl, Tomography.jl

INVITED TALKS

2026.09. How Medical Images Are Made—and How AI Can Help; Incheon Metropolitan City Office of Education Shintree Library
2026.08. Introduction to Machine Learning and Material Engineering; 2026 Workshop on AI and Mathematics, Kyungpook National University
2025.10. Applications of Artificial Intelligence in Mathematics and Materials Science Research; AI Seminar Special Lecture, Kyungpook National University
2024.08. Introduction to inverse problem and deep learning for photoacoustic tomography; Workshop for Young Mathematicians in Korea (WYMK), Seoul National University

AWARDS AND FELLOWSHIPS

- 2024.12. 『Julia Programming』. Selected for the [2024 Sejong Book List Academic Category](#)
- 2024.08. Top Award for Workshop for Young Mathematicians in Korea (WYMK)
- 2022.05. Top Award for Spring Graduate Student Academic Presentation, the Korean Data Information Science Society (KDISS)
- 2021.03. Kyungpook National University Ph.D. Fellowship (Graduate student with excellent research achievements, recommended by project division)
- 2016.09. Encouragement Award for College of Natural Sciences Student Academic Presentation, Kyungpook National University

LINKS

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