

Sangwoo Han

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<https://github.com/Seismic-wave-Han>

Education

Seoul National University <i>Combined M.S. and Ph.D. program in Seismology and Geophysics (GPA: 4.22/4.8)</i>	March 2021 – Present <i>Seoul, Republic of Korea</i>
Seoul National University <i>School of Earth and Environmental Sciences (GPA: 3.9/4.3 Summa Cum Laude)</i> <ul style="list-style-type: none">• B.S. in Earth and Environmental Sciences• B.S. in Computational Sciences	March 2014 – February 2021 <i>Seoul, Republic of Korea</i>

Experience

Visiting Researcher <i>Rice University</i> <ul style="list-style-type: none">• Advisor: Jonathan Ajo-Franklin (email: ja62@rice.edu)• Microearthquake Detection and Location by using Distributed Acoustic Sensing (DAS) and Nodal Geophone Array in Imperial Valley, California	November 2024 – May 2025 <i>Houston, Texas, United States</i>
Teaching Assistant & Research Assistant <i>Seoul National University</i>	2021, 2022, 2023 <i>Seoul, Republic of Korea</i>
Field experience <i>Seoul National University</i> <ul style="list-style-type: none">• Deployment of the linear array with geophones in Hongseong-Yugyu area (Oct 2023-Nov 2023)• Deployment of the linear array with geophones on the fault zone of the 2016 Mw 5.5 Gyeongju earthquake (Nov 2020-Dec 2020)	2020, 2023 <i>Seoul, Republic of Korea</i>
Undergraduate Researcher <i>Seoul National University</i> <ul style="list-style-type: none">• Advisor: YoungHee Kim (email: younghkim@snu.ac.kr)• Imaging 3-dimensional rupture processes of the 2015 Peru deep earthquake doublet by back-projection (Sep 2020-Feb 2021)• The Kamchatka-Kuril subduction zone earthquakes catalog data analysis, especially, in regard to 2006 M8.3 great earthquake (Jun 2019-Aug 2019)	2019, 2020 <i>Seoul, Republic of Korea</i>
Undergraduate Researcher <i>Music and Audio Research Group, Seoul National University</i> <ul style="list-style-type: none">• Advisor: Kyogu Lee (email: kglee@snu.ac.kr)• Singing voice lyrics syllable alignment by using pitch and amplitude	June 2020 – August, 2020 <i>Seoul, Republic of Korea</i>
ML&DL internship <i>Enlighten (Solar power energy IT platform)</i> <ul style="list-style-type: none">• Forecasting solar power generation using sun behavior and climate data by ML&DL	December, 2019 – February, 2020 <i>Seoul, Republic of Korea</i>
Auxiliary Firefighter (Mandatory Military Service) <i>Hongcheon Fire Station</i>	June, 2017 – April, 2019 <i>Gangwon, Republic of Korea</i>

Awards & Honors

NRF Doctoral Research Fellowship

National Research Foundation of Korea

2025-2026

2025 SSA Annual Meeting Student Presentation Awards

Seismological Society of America

2025

Support Program for Outstanding Graduate Students' International Joint Research

Brain Korea 21 grant

2024-2025

Seoul National University Alumni Association Scholarship/Development Fund Scholarship

Seoul National University

2022-2023

Brain Korea 21 Scholarship

National Research Foundation of Korea

2021,2022

Best Paper Award (poster presentation)

Geological Society of Korea

2021

2nd Place Award in Geological Resource Data Utilization and AI Competition

Korea Institute of Geoscience and Mineral Resources

2021

Presidential Science Scholarship

Korea Student Aid Foundation

2014-2016,2019

Skills

Seismological analysis

Rupture process analysis, Focal mechanism, EGF analysis, Slip inversion, Stress inversion, Back-projection, Microseismicity detection and location, Waveform modeling, Distributed acoustic sensing, Receiver function

Programming experience

Python (NumPy, Pandas, Scikit-Learn, Matplotlib, PyGMT, TensorFlow, PyTorch), Matlab, Linux, GitHub

Language

English, Korean (native)

Manuscripts in Preparation / Submitted

[2] Han, S., Ajo-Franklin, J., Kim, J., Nayak, A., and & Kim, Y. Near-simultaneous nucleation of a two-episode microearthquake rupture resolved with distributed acoustic sensing. (*in prep.*)

[1] Han, S. & Kim, Y. Determining Small Earthquake Focal Mechanisms Using 360° S-Wave Polarization: Insights from Dense Seismic Arrays. (*reviewed in Geophysical Journal International*)

Research Publications

[6] Seo, M.-S., Kim, W.-Y., Han, S., Park, J. Y., & Kim, Y. (2025). Complex Multi-patch Rupture and Aftershock Characteristics of the 2024 Mw 4.2 Buan, Korea, Earthquake Sequence. (*accepted in Seismological Research Letters*)

[5] Han, S., Kim, W. Y., Park, J. Y., Seo, M. S., & Kim, Y. (2024). Rupture model of the 5 April 2024 Tewksbury, New Jersey, earthquake based on regional Lg-wave data. *The Seismic Record*, 4(3), 214-222.

[4] Han, S., Kim, W.-Y., Lim, H., Son, Y. O., Seo, M.-S., Park, J. Y., & Kim, Y. (2024). Resolving multi-stage rupture process of the 2021 Mw 4.9 Offshore Jeju Island earthquake from relative source time functions. *Geophysical Research Letters*, 51(3), e2023GL106059.

- [3] Kim, W.-Y., Seo, M.-S., Park, J. Y., **Han, S.**, Son, Y. O., & Kim, Y. (2023). The 28 October 2022 Mw 3.8 Goesan earthquake sequence in central Korea: stress drop, aftershock triggering, and fault interaction. *Bulletin of the Seismological Society of America*, 113(6), 2416-2431.
- [2] Kim, W.-Y., Park, J. Y., Seo, M.-S., Son, Y. O., Lim, H., **Han, S.**, & Kim, Y. (2022). The 14 December 2021 Mw 4.9 offshore Jeju Island, Korea, earthquake: Seismological observation of an intraplate earthquake provides insight into regional seismotectonics. *The Seismic Record*, 2(2), 107-117.
- [1] Lim, H., Kim, Y., Kwon, K. B., Han, J., Ahn, B. S., Chai, G., ... & Ree, J. H. (2021). Deployment of the linear array with geophones on the fault zone of the 2016 Mw 5.5 Gyeongju earthquake. *Journal of the Geological Society of Korea*, 57(5), 741-746.

Conference presentation

- [9] **Han, S.**& Kim, Y. (2025). Determining Small Earthquake Focal Mechanisms Using 360° S-Wave Polarization. In *SSA Annual Meeting*. (*awarded)
- [8] **Han, S.**& Kim, Y. (2024). Fault complexity revealed by focal mechanisms of small earthquakes in Gyeongju, South Korea: effective use of S-wave polarizations retrieved from the high-density seismic array. In *37th International Geological Congress*.
- [7] **Han, S.**& Kim, Y. (2024). Improving focal mechanism solutions with 3-D S-wave ground motion: Toward routine determination of the focal mechanisms and detailed earthquake source characterization with Gyeongju Hi-density Broadband Seismic Network (GHBSN) data. In *Asia Oceania Geosciences Society Annual Meeting*.
- [6] **Han, S.**, Kim, W.-Y., Lim, H., Son, Y. O., Seo, M.-S., Park, J. Y., & Kim, Y. (2023). Resolving source parameters and multi-stage rupture process of the 2021 Mw 4.9 Offshore Jeju Island (Korea) Earthquake. In *AGU Annual Meeting*.
- [5] **Han, S.**, & Kim, Y. (2023). Focal mechanism determination from the 3-D ground motion of S wave: towards detailed earthquake source characterization with Gyeongju High-Density Broadband Seismic Network (GHBSN) data. In *Joint Fall Meeting of Korean Geological Societies*
- [4] **Han, S.**, Kim, W.-Y., Lim, H., Son, Y. O., Seo, M.-S., Park, J. Y., & Kim, Y. (2023). Multi-stage Rupture Process of the 2021 Mw 4.9 Offshore Jeju Island Earthquake from Relative Source Time Functions.In *Joint Fall Meeting of Korean Geological Societies*
- [3] **Han, S.**, Kim, W.-Y., & Kim, Y. (2022).Source Complexity of the 2021 Mw 4.9 Offshore Jeju Island, Korea, Earthquake. In *AGU Annual Meeting (online)*
- [2] **Han, S.**, Kim, W.-Y., Lim, H., Son, Y. O., Seo, M.-S., Park, J. Y., & Kim, Y. (2022). Analysis of Complex Rupture Process of 2021 Mw 4.9 Offshore Jeju Island Earthquake. In *Joint Fall Meeting of Korean Geological Societies*
- [1] **Han, S.**, & Kim, Y. (2021). Back-projection imaging of small earthquake ruptures using the data from Gyeongju High-Density Broadband Seismic Network. in *Joint Fall Meeting of Korean Geological Societies*. (*awarded)