MENTORING & ADVISEMENT

Undergraduate Student Advisees

SNU School of Earth & Environmental Sciences | Undergraduate Thesis Research

[§ *Best Undergraduate Thesis Research Award*]

2013 – 2014	Hobin Lim ***Imaging subduction structures beneath southern Mexico by high-precision earthquake relocation***
2014 – 2015	§Young-Wook Kim ***Structure and seismological properties of the subduction plate boundary in southern Peru***
2015 – 2016	Hyoihn Jang ***Seismic attenuation structure beneath Jeju Island, Mexico and Peru: Implications for magmatism and fluids***
2015 – 2016	Hee-Chul Jung ***Seismic structure beneath Upper Cook Inlet Basin in Alaska through receiver functions, H-k stacking, and 1-D iterative-optimizing modeling***
2016 – 2017	Young-Jin Ryu ***Crustal P-wave velocity analysis using earthquakes from Korean Peninsula***
2016 – 2017	§HyeJeong Kim ***Lithospheric velocity structure of three volcanic islands near Korean Peninsula***
2017 – 2018	Jeena Yoon ***Lateral variations of crustal seismic attenuation in Central California from Lg Q inversion***
2017 – 2019	§Jaewoo Kim ***Detecting pore-fluid pressure change by shear-wave splitting in 2017 Mw 5.4 Pohang earthquake region***
2019 – 2021	Min Seong Seo ***Complex spatiotemporal triggering of 2017-2018 Pohang aftershock sequence revealed by nearest neighbor analysis***
2019 – 2021	Sangwoo Han ***Imaging 3-dimensional rupture processes of the 2015 Peru deep earthquake doublet by back-projection***
2019 – 2021	Young Oh Son ***Constraints on crustal properties in South Korea from virtual deep seismic sounding***

Summer (International) Guest Student Advisees | Undergraduate Thesis Research

2018	Sungbin Cho (B.S. student at University of Texas at Austin) ***Origin of the Columbia River flood basalt – probing lithospheric interactions with Yellowstone plumes*** - *Co-advised by Prof. C. Wilson (UT Austin)*

SNU Student Directed Education (SDE) Program | Undergraduate Research Project

The SDE program is a highly competitive research program at SNU open to undergraduates in all disciplines. Only ~30 projects are selected each year, and those research results are evaluated for awards.

2016 HyeJeong Kim

Lithospheric velocity structure of three volcanic islands near Korean Peninsula

- Received research fund of 3,000,000 won (~2,700 USD) for 6 months
- Won the first-place award

2019 Jaewoo Kim

Detecting pore-fluid pressure change by shear-wave splitting in 2017 Mw 5.4 Pohang earthquake region

- Received research fund of 3,000,000 won (~2,700 USD) for 6 months
- Won the second-place award

2020 Young Oh Son & Min-Seong Seo

Measurement of seismometer misorientation based on P-wave polarization: Application to permanent and dense temporary seismic arrays in South Korea

- Research fund of 6,000,000 won (~5,400 USD) for 6 months
- Link to research results (in Korean): https://www.youtube.com/watch?v=ic7wKafJa6c
- Publication resulted from this research:
  - [1] Son, Y. O., M.-S. Seo, and Y. Kim (2021), Measurement of seismometer misorientation based on P-wave polarization: application to permanent seismic network in South Korea, *Geosciences Journal*. https://doi.org/10.1007/s12303-021-0031-5
  - [2] Seo, M.-S., Y. O. Son, Y. Kim, T.-S. Kang, J. Rhie, K.-H. Kim, and J.-H. Ree (2022), Measurement of seismometer misorientation based on P-wave polarization: application to dense temporary broadband seismic array in the epicentral region of 2016 Gyeongju earthquake, South Korea, *Geosciences Journal*. https://doi.org/10.1007/s12303-021-0041-3

SNU College of Natural Sciences Undergraduate Internship Program | Undergraduate Research Project

The internship opportunities in SNU College of Natural Sciences are offered SNU & non-SNU undergraduate students for four sessions (Fall & Spring semesters; Summer & Winter sessions). About 10 projects are selected in each term in Earth & environmental science disciplines.

2013 Chang-Hyun Choi
Seismic data processing for ambient noise tomography

2014 Jung-Hoon Song
Receiver function analysis using Korean seismic data

2015 Hee-Chul Jung
Receiver function analysis using MOOS array in Cook Inet Basin

2015 Hyoihn Jang
Constraining seismic attenuation structure beneath Jeju Island, S. Korea

2015 Dong-Hyuk Kang
Exploring basic seismic array processing

2015 Young-Jin Ryu
Receiver function modeling for lithospheric structure beneath S. Korea

2016	Tae-Yoon Kim
	Exploring methods of seismic tomography
2016	Min Seong Seo
	Earthquake detection based on STA/LTA algorithm using Cascadia Initiative ocean-bottom seismic data
2017	HyeJeong Kim
	Lithospheric velocity structure of three volcanic islands near Korean Peninsula
2017	Jaewoo Kim
	Exploring methods of shear-wave splitting to probe local seismic anisotropy
2017	Jisoo Kim
	Receiver function analysis using seismic data in Arabia Peninsula
2018	Jun Yong Park (Chungnam University)
	Exploring methods for detection and location of earthquakes using ocean bottom seismic data
2018	Jaewoo Kim
	Detecting pore-fluid pressure change by shear-wave splitting in 2017 Mw 5.4 Pohang earthquake region
2019	Young Oh Son
	Detection and space-time location of non-volcanic tremors
2019	Sangwoo Han
	Seismic data classification using machine learning
2019	Min Seong Seo
	Multifractal characterization of seismic activity
2019	Young Oh Son
	Detection and location of earthquake tremors in Nankai subduction zone, SW Japan
2020	Joo-Hyung Lee
	Detection and location of 2016 M 5.5 Gyeongju earthquake using OBSPy
2020	Sangwoo Han
	Classification of shallow/deep earthquakes using spectrogram
2020	Seung-Hoon Han
	Shear-wave splitting analysis using dense seismic array in SE part of Korea
2021	Young Oh Son
	Constraints on crustal properties in South Korea from virtual deep seismic sounding
2021	Seung-Hun Choi
	Earthquake source properties in East Sea
2021	Youjin Kim
	Detecting earthquake swarm signals: Example from Haenam earthquake
2021	Afiqah Azhan
	Receiver function study for Alaska Mount Spurr volcanic structure
2021	Minyoung Choi
	Earthquake relocation of micro-seismicity in Jeju Island, South Korea

Graduate Student & Postdoctoral Scientist Advisees

M.S. Student Advisees

2020 – 2022	Jaewoo Kim (M.S. degree at Feb. 2022)
	Thesis title: ***Spatiotemporal variation in upper crustal seismic anisotropy and V_P/V_S ratio in Groningen gas field, Netherlands: Insights from shear wave splitting***

2019 – 2021 Jeena Yoon (M.S. degree at Feb. 2021)
Thesis title: ***Spatial variation of the Lg wave attenuation along the CCSE array in Central California, US***

2016 – 2017 Hyoihn Jang (M.S. degree at Feb. 2017)
Thesis title: ***Seismic attenuation structure beneath Nazca Plate subduction zone in southern Peru***
Project title: ***1. A possible roll-over slab geometry under the Caroline Plate imaged by Monte Carlo finite-frequency traveltime inversion of teleseismic SS phases***
2. Seismic attenuation structure of Nazca Plate subduction zone in southern Peru

M.S.-Ph.D. Joint Program Student Advisees

Spring 2021 – Sangwoo Han (M.S. student)
Project title: ***Imaging 3-dimensional rupture processes of the 2015 Peru deep earthquake doublet by back-projection***

Spring 2021 – Min Seong Seo (M.S. student)
Project title: ***Complex spatiotemporal triggering of aftershocks revealed by nearest neighbor analysis: Case study of 2017-2018 Pohang aftershock sequence in South Korea***

2019 – present Jun Yong Park (M.S. student)
Project title: ***1. Detection and location of local earthquakes in the oldest Pacific plate using the Oldest-1 (Pacific Array) data***
2. Detection and location of seismicity in Yellow Sea, S. Korea

2016 – present Soojinn Hyung (Ph.D. student; *leave of absence*)
Project title: ***Teleseismic Constraints on Crustal structure of the Grenville Province in eastern North America***

2015 – 2020 Hobin Lim (Ph.D. at Aug. 2020)
Thesis title: ***Geophysical investigations of the subduction zone in Peru and the 2017 Pohang earthquake in South Korea***
Project title: ***1. Evidence of an upper mantle seismic anomaly opposing the Cocos slab beneath the Isthmus of Tehuantepec, Mexico***
2. Earthquake source mechanism and rupture directivity of the 12 September 2016 Mw 5.5 Gyeongju earthquake, South Korea
3. Measurement of borehole seismometer orientation using tangential P-wave receiver function based on harmonic decomposition
4. Seismicity and structure of Nazca Plate subduction zone in southern Peru
5. Data-oriented constraint on the interpretation of S receiver function and its application to observations of seismic discontinuities in the lithosphere-asthenosphere system
6. Seismic attenuation structure of southern Peruvian subduction system
7. 2017 Mw 5.5 Pohang earthquake, South Korea, and poroelastic stress change associated with fluid injection
8. A dataset of seismic sensor responses of South Korea seismic stations

Ph.D. Student Advisees

2017 – present Hyunsun Kang (Ph.D. candidate)
Proposal thesis title: ***Seismic structure beneath various tectonic settings constrained from seismic array data***
Project title: ***1. Localized anisotropic subduction-zone structure in southern Peru: Constraints from teleseismic receiver functions and forward modeling***
2. Seismic crustal structure beneath Jeju Volcanic Island, South Korea
3. Deep seismic crustal structure beneath Wallowa, Columbia River flood basalt province

2012 – 2020 Eunyoung Kim (Ph.D. at Feb. 2020)
Thesis title: ***Investigation of 3-D crustal velocity structure from seismic tomography and effective medium modeling of anisotropic seismic properties of rocks***
Project title: ***1. Upper crustal seismic structure of the Endeavour segment, Juan de Fuca Ridge from traveltime tomography: Implications for oceanic crustal accretion***
2. GassDem: A MATLAB program for modeling the anisotropic seismic properties of porous medium using differential effective medium theory and Gassmann's poroelastic relationship
3. AnisEulerSC: A MATLAB program combined with MTEX for modeling the anisotropic seismic properties of a polycrystalline aggregate with microcracks using self-consistent approximation

Guest Student Advisees

2020 - present Hwaju Lee (Ph.D. candidate at University of Minnesota)
Project title: ***Seismic anisotropy and mantle flow in Nazca plate subduction system***

International Predoctoral Researcher Advisees

2017 Sagar Singh (M.S. at Indian Institute of Technology Roorkee)
Project title: ***Exploring capability of full waveform inversion using Korean seismic data***

Postdoctoral Scientist

Sep 2020 - present Hobin Lim
Project title: ***1. Fault zone structure imaged by teleseismic receiver function with geophone array in (1) Clark fault, California, US and (2) Yangsan fault, S. Korea***
2. Application of seismic array processing to assess station quality in Gyeongju, South Korea

Sep 2021 - present Hwaju Lee
Project title: ***1. Seismic anisotropy and mantle flow in Nazca plate subduction system***
2. Understanding of mantle dynamics in East Asia: An insight gained from anisotropy in seismic velocity