

Kuan-Fu Feng

Research Seismologist with over 10 years of experience specializing in time series analysis, signal processing, and time-dependent monitoring. Skilled in seismic monitoring and scientific computing. Proficient in programming with recent experience in cloud computing and open-source tools development. Capable of converting scientific models into practical workflows and passionate about bridging research with real-world engineering solutions.

RESEARCH PROJECT

Time-Lapse Seismic Monitoring of Subsurface Change

- Analyzed high-resolution seismic time series and multi-frequency ambient noise to detect subsurface velocity variations linked to hydrology.
- Implemented physical-based and statistical inversion methods to model groundwater-surface interactions.
- Collaborated with interdisciplinary teams to enhance monitoring frameworks and data interpretation.

Time-dependent Seismic Tomography

- Inverted regional earthquake data to image crustal seismic velocity structures.
- Evaluated effects of ray path coverage and arrival-time picking on inversion accuracy and uncertainty.
- Refined modeling approaches to improve sensitivity analyses of observational geometry.

SKILL

Software Engineering	Linux/Unix, Git/GitHub, Jupyter notebook, Visual Studio Code
Programming Languages	Python, Fortran, C, C++, Bash Script
Scientific/Technical Skills	Time series analysis, Signal processing, Inversion methods, Statistical analysis
Data visualization	ParaView, Adobe Illustrator, Matplotlib, Seaborn
Cloud/HPC Environment	AWS (S3, EC2, Jupyter), parallel scripting, workflow automation

WORK EXPERIENCE

Postdoctoral Research Associate

University of Utah, USA

Dec 2024 - present

- Applied seismic signal analysis techniques to monitor groundwater changes over time, integrating multi-scale geophysical datasets.
- Integrating inversion workflows with environmental datasets to improve hydrogeophysical model accuracy.

Postdoctoral Scholar

University of Washington, USA

Jun 2023 - Nov 2024

- Developed data-driven models linking near-surface seismic changes to groundwater-surface interactions.
- Contributed code and testing to an open-source environmental seismology toolkit, improving functionality and performance.
- Assisted in delivering practical workshops on cloud computing, promoting scalable seismic data processing using AWS.

Postdoctoral Fellow

University of Utah, USA

Jun 2022 - May 2023

- Processed and analyzed over 10 TB of high-resolution ambient noise data for time-lapse velocity monitoring.
- Investigated the influence of ambient noise sources on seismic array performance at multiple scales.
- Participated in nodal seismic array deployment in Los Angeles Basin [LAB2022]

Graduate Research Assistant

National Taiwan University / Institute of Earth Sciences, Academia Sinica, Taiwan

Sep 2017 - Jan 2022

- Performed time-frequency domain analysis on multi-year seismic datasets to track crustal property changes.
- Designed and implemented noise-based seismic monitoring systems for tectonic and hydrological studies.
- Analyzed earthquake sequences, rupture directivity, focal mechanisms, and seismic velocity models to study seismogenic structures.
- Assisted with the employment of portable and permanent seismic arrays in landslide-prone regions of Taiwan.

Research Assistant

Institute of Earth Sciences, Academia Sinica, Taiwan

full-time

Oct 2016 - Aug 2017

- Maintained and tested Real-time Earthquake Moment Tensor Monitoring System.
- Constructed finite-fault models of subduction zone events using broadband waveform modeling.

LEADERSHIP & SERVICE

President, Graduate Student Association

Department of Geosciences, National Taiwan University

2018

- Elected by peers to represent graduate students; served as a liaison between the department and the student body.
- Organized student forums and summer lectures for the department and institute to promote interdisciplinary engagement and discourse.

Summer Student Lecture Convenor and Instructor

Institute of Earth Sciences, Academia Sinica, Taiwan

Summer 2018 and 2019

- Managed logistics for an institute summer lecture series aimed at undergraduate and early-career students.
- Designed and delivered instruction on earthquake seismology and time-series analysis for undergraduates.
- Coordinated multi-session lecture series, scheduling speakers and promoting student participation.
- Invited internal researchers to speak on applied geophysics, seismology, and earth system science.

EDUCATION

PhD	<i>Geosciences, National Taiwan University, Taiwan</i>	<i>Sep 2017 - Jan 2022</i>
Master	<i>Geosciences, National Taiwan University, Taiwan</i>	<i>Sep 2014 - Jun 2016</i>
Bachelor	<i>Earth and Environmental Sciences, National Chung Cheng University, Taiwan</i>	<i>Sep 2010 - Jan 2014</i>

THESIS/DISSERTATION

T=THESIS, D=DISSERTATION

- [D.1] Noise-based monitoring on crustal seismic velocity variations. (2022) *National Taiwan University*
- [T.1] Investigating the uncertainty of time-dependent seismic velocity changes using travel-time tomography: a case study of the M_L 6.4 2013 Rueisuei earthquake, Taiwan. (2016) *National Taiwan University*

PRE-PRINT

R=UNDER REVIEW

- [R.1] Feng, K.-F., et al. (2024) **A decadal survey of the near-surface seismic velocity response to hydrological variations in Utah, United States.** *submitted to the Journal of Geophysical Research: Solid Earth.*
- [R.2] Kidiwela, M., et al. (2025) **Active Protothrusts and Fluid Highways: Seismic Noise Reveals Hidden Subduction Dynamics in Cascadia.** *submitted manuscript: Confidential*
- [R.3] Ni, Y., et al. (2025) **A Review of Cloud Computing in Seismology.** *submitted to Geophysical Journal International*

PUBLICATION

J=JOURNAL, P=IN PREPARATION

- [J.6] Denolle, M., et al. (2025) **Training the Next Generation of Seismologists: Delivering Research-Grade Software Education for Cloud and HPC Computing Through Diverse Training Modalities.** *Seismological Research Letters*
- [J.5] Feng, K.-F., et al. (2021). **Controls on seasonal variations of crustal seismic velocity in Taiwan using single-station cross-component analysis of ambient noise interferometry.** *Journal of Geophysical Research: Solid Earth*, 126(11), e2021JB022650.
- [J.4] Feng, K.-F., et al. (2020). **Detecting pre-eruptive magmatic processes of the 2018 eruption at Kilauea, Hawaii volcano with ambient noise interferometry.** *Earth, Planets and Space*, 72, 74.
- [J.3] Hsu, Y.-F., et al. (2020). **Evidence for Fluid Migration During the 2016 Meinong Taiwan Aftershock Sequence.** *Journal of Geophysical Research: Solid Earth*, 125(9), e2020JB019994.
- [J.2] Lee, S.-J., et al. (2018). **Composite megathrust rupture from deep interplate to trench of the 2016 Solomon Islands earthquake.** *Geophysical Research Letters*, 45(2), 674-681.
- [J.1] Brown, D., et al. (2015). **Imaging high-pressure rock exhumation in eastern Taiwan.** *Geology*, 43(7), 651-654.
- [P.1] Feng, K.-F., et al. **Measuring shallow seismic attenuation in the Pacific Northwest and southern California of the United States using ambient noise seismology.** *TBD.*