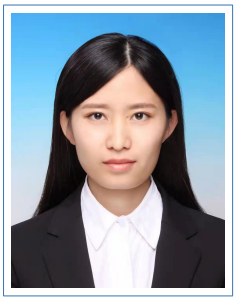
Yumin Zhao

Curriculum Vitae

EW1-02-05, Engineering Drive 2, Department of CEE
National University of Singapore, Singapore,117576
(+65) 84355251
yumin_zhao@nus.edu
Google Scholar *Github* *Linkedin*



Education

2018–present **PhD, Geophysics**, *National University of Singapore*, Singapore.

2014–2017 : **Master of Science, Geophysics**, *China University of Petroleum-Beijing*, Beijing, China.

2010–2014 : **Bachelor of Engineering, Geophysics**, *China University of Petroleum-Beijing*, Beijing, China.

Publications

Journal Articles

2023 **Zhao, Yumin**, Enhedelihai Nilot, Bei Li, Gang Fang, Wei Luo, and Yunyue Elita Li. Seismic attenuation extraction from traffic signals recorded by a single seismic station. *Geophysical Research Letters, accepted*, 2023.

2023 **Zhao, Yumin**, Yunyue Elita Li, and Bei Li. On beamforming of DAS ambient noise recorded in an urban environment and Rayleigh-to-Love waves ratio estimation. *submitted*, 2023.

2023 **Zhao, Yumin** and Yunyue Elita Li. Near-surface imaging with Rayleigh and Love waves extracted from DAS ambient noise data. *submitted*, 2023.

2023 Yunyue Elita Li, Enhedelihai Nilot, **Zhao, Yumin**, and Gang Fang (all authors are equally contributed). Quantifying urban activities using nodal seismometers in a heterogeneous urban space. *under review*, 2023.

2022 **Zhao, Yumin**, Yunyue Elita Li, Enhedelihai Nilot, and Gang Fang. Urban Running Activity Detected Using a seismic sensor during COVID-19 Pandemic. ***Seismological Research Letters***, volume 93, pages 181–192, 2022.

2020 Gang Fang, Yunyue Elita Li, **Zhao, Yumin**, and Eileen R Martin. Urban near-surface seismic monitoring using distributed acoustic sensing. ***Geophysical Research Letters***, volume 47, page e2019GL086115. Wiley Online Library, 2020.

2017 **Zhao, Yumin**, Guo-Fa Li, Wei Wang, Zhen-Xiao Zhou, Bo-Wen Tang, and Wen-Bo Zhang. Inversion-based data-driven time-space domain random noise attenuation method. ***Applied Geophysics***, volume 14, pages 543–550. Springer, 2017.

Peer-reviewed conference papers

2022 **Zhao, Yumin**, Yunyue Elita Li, Bei Li, Wei Luo, Zhaoyin Liu, and Yuxuan Zhou. Seismic attenuation extracted from isolated traffic signals. In ***Second International Meeting for Applied Geoscience & Energy***, pages 2071–2075. Society of Exploration Geophysicists, 2022.

2021 **Zhao, Yumin**, Yunyue Elita Li, and Bei Li. Estimation of Rayleigh to Love waves ratio from ambient noise recorded by DAS. In ***First International Meeting for Applied Geoscience & Energy***, pages 447–451. Society of Exploration Geophysicists, 2021.

2021 Enhedelihai Nilot, Gang Fang, Yunyue Elita Li, and **Zhao, Yumin**. Characterizing ambient seismic sources in an urban environment. In ***First International Meeting for Applied Geoscience & Energy***, pages 1906–1910. Society of Exploration Geophysicists, 2021.

2021 Gang Fang, Yunyue Elita Li, Enhedeliha Nilot, **Zhao, Yumin**, and Arthur Cheng. Anonymous vehicle identification on seismic spectrograms. In ***First International Meeting for Applied Geoscience & Energy***, pages 1886–1890. Society of Exploration Geophysicists, 2021.

2021 Yunyue Elita Li, Enhedelihai Nilot, **Zhao, Yumin**, and Gang Fang. Urban activity monitoring using wireless geophones in Singapore. In ***First International Meeting for Applied Geoscience & Energy***, pages 3209–3214. Society of Exploration Geophysicists, 2021.

2020 **Zhao, Yumin** and Yunyue Elita Li. On beamforming of ambient noise recorded by DAS. In ***SEG Technical Program Expanded Abstracts 2020***, pages 515–519. Society of Exploration Geophysicists, 2020.

2019 **Zhao, Yumin**, Yunyue Elita Li, and Gang Fang. Extracting subsurface information based on extremely short period of DAS recordings. In ***SEG Technical Program Expanded Abstracts 2019***, pages 958–962. Society of Exploration Geophysicists, 2019.

2017 Wei Wang, Guofa Li, **Zhao, Yumin**, Wuyang Yang, and Wanli Wang. Laterally-constrained sparse deconvolution in the mixed domain. In ***SEG Technical Program Expanded Abstracts 2017***, pages 808–812. Society of Exploration Geophysicists, 2017.

2016 **Zhao, Yumin**, Guofa Li, Jizhen Wei, Bei Li, Jingjing Wang, and Mingchao Wang. Inversion-based t-x Domain Signal-preserving Random Noise Reduction method. In ***78th EAGE Conference and Exhibition 2016***, volume 2016, pages 1–5. European Association of Geoscientists & Engineers, 2016.

2016 **Zhao, Yumin**, Guofa Li, and Bei Li. A robust deconvolution algorithm with sparsity and lateral continuity constraints for nonstationary seismic data. In ***SEG Technical Program Expanded Abstracts 2016***, pages 5203–5207. Society of Exploration Geophysicists, 2016.

2016 **Zhao, Yumin**, Guofa Li, and Bei Li. A Robust Deconvolution Algorithm with Sparsity and Lateral Continuity Constraints. In ***78th EAGE Conference and Exhibition 2016***, volume 2016, pages 1–5. European Association of Geoscientists & Engineers, 2016.

Research Experience

National University of Singapore, Civil and Environmental Engineering

August,2021 – April 2022 ***Seismic attenuation extracted from traffic signals recorded by a seismic sensor***.
- Detected isolated traffic signals from seismic ambient noise data.
- Extracted daily seismic attenuation statistically from hundreds of traffic signals.
- Analyzed the potential factors which cause variations in seismic attenuation.

July,2020 – Jan,2021 ***Urban Running Activity Detected Using a Seismic Sensor during COVID-19 Pandemic***.
- Developed an algorithm and a python package for automatic footstep signal detection and runner count from urban seismic ambient noise.

Jan,2020 – June,2021 ***Near-surface imaging with DAS ambient noise data***.
- Developed a method to invert the near-surface shear-wave velocity model from both Rayleigh and Love waves with the dispersion spectrum inversion method.

Jan,2019 – June,2020 ***On beamforming of ambient noise recorded by DAS and wave type identification***.
- Simulated urban seismic ambient noise (geophone/DAS).
- Tested the reliability of beamforming on DAS ambient noise under different source conditions.
- Identified surface wave types in the DAS ambient noise data.
- Developed an algorithm to invert the Rayleigh-to-Love waves (R/L) ratio from DAS ambient noise data.

Jan,2019 – Jan,2020 ***Urban near-surface seismic monitoring using distributed acoustic sensing (DAS) (co-contributor)***.
- Processed the DAS quarry blast data: remove the near-field noise (traffic, construction, etc.), extract the seismic interferometry, and estimate the surface waves phase velocities.

Aug,2018 – April,2019 ***Extracting subsurface information based on extremely short period of DAS recordings***.
- Removed the near-field noise in the DAS ambient noise data.
- Extracted the seismic interferometry and dispersion spectrum from 2-min DAS ambient noise data.

China University of Petroleum-Beijing, Department of Geophysics and Information Engineering

April,2016 – April,2017 ***Multi-trace seismic data deconvolution***.
- Developed a multi-trace seismic data deconvolution method that is robust to noise and performs well in preserving the lateral continuity of the inversion result.

Sep,2014 – April,2016 ***Inversion-based time-space domain random noise reduction***.
- Developed an inversion-based random noise reduction method in the time-space domain using the prediction error filter (PEF) calculated from the noisy data as the regularization term.

Professional service

2018–present **Reviewer (journals)**.
- *Geophysics*
- *Computers and Geosciences*
- *Exploration Geophysics*

Awards & Honors

2018 –2021 ***NUS research scholarship***

2017 ***Outstanding presentation*** for Thesis of M.S., CUPB

2015 ***Third prize,*** the 3rd "Oriental Cup" National Exploration Geophysics Competition for College Students (NEGCCS)

Skills

Seismic data processing: Seismic noise reduction, frequency/time-frequency analysis, automatic events detection, etc.

Seismic data simulation: Seismic ambient noise (Geophone/DAS), seismic exploration data

Inversion: Gradient-based and heuristic global inversion for geophysical problems, Machine Learning, Deep Learning

Programming Languages: Python, Matlab, R, C, C++

Teaching Assistantship

Fall, 2020 : **CE3201: Civil Engineering Analytics and Data Visualization**.