Hongrui Peng

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Education

- **M.S. in Solid Earth Geophysics**, Wuhan University, GPA: 3.81/4.0 2021 - 2024 (expected)

  Thesis: A Rayleigh wave attenuation tomography method based on noise interferometry (In preparation)
  Advisor: Prof. Jiangtao Li

- **B.S. in Geophysics**, Wuhan University, GPA: 3.8/4.0 2017 - 2021

  Thesis: The spatial-temporal analysis of hydrology and climate elements in the Mekong River Basin
  Advisor: A/Prof. Hok Sum Fok

- **Minor in Computer Science and Technology**, Wuhan University, GPA: 3.68/4.0 2018 - 2020

  Related Courses: Digital Logic, Discrete Mathematics, Data Structure, Object-Oriented Programming

Research Interests

I am broadly interest in everything associated with seismology and tectonics, especially:

- **Seismic Ambient Noise**

  (1) The origin and spatial-temporal variation of seismic noise fields;
  (2) Extracting more information from interferometry (e.g., Attenuation, Body wave, Higher-modes);

- **Earth Structure Imaging**

  (1) Attenuation tomography (esp., partial-melting body, such as magma chamber, potential crust flow);
  (2) Fault zone imaging;

I am also enthusiastic about learning other cutting-edge techniques, such as full-waveform inversion, and DAS seismology.

Research Experience

- **Research Assistant**, Wuhan University 2021 - present

  With Prof. Jiangtao Li, and Prof. Yudi Pan, I mainly focus on the following fields:

  Ambient Noise Attenuation Tomography: I developed a workflow to preserve the relative amplitude information in EGFs; and following Weaver's theoretical framework, I retrieved attenuation, site amplification, and noise intensity from ambient noise. This method has been tested in several regions (e.g., NE China, Yellow Stone National park).

  Imaging with Short-term Nodal Arrays: Utilizing records from node seismometers, I imagined shallow structures in Antarctica and Yunnan, China. I also developed a method to separate different modes of surface wave with inverse wavelet transform.

  Nature of Ambient Noise Field: I analyzed the spatial-temporal variation of the ambient noise field with beam-forming and wavelet analysis. I am also trying to develop effective methods to separate constructive and destructive noise in EGFs.

- **Undergraduate Research Assistant**, Wuhan University 2018 - 2021

  Magnetic Field Modeling: With Prof. Zhengtao Wang, I studied geomagnetism; by utilizing measurements from ESA's Swarm mission, we inverted to monthly spherical harmonic models of the Earth's magnetic field.

  Hydrology and Climate: With A/Prof. Hok Sum Fok, I studied how ocean tide alter the Stage-discharge relationship in estuary regions, and monsoon's influence on precipitation and water storage in Southeast Asia.

Publications

[1]. **Hongrui Peng**, Jiangtao Li (2023). Rayleigh wave attenuation tomography based on ambient noise interferometry: methods and an application to Northeast China. *Geophysical Journal International*. (Under review)

[2]. **Hongrui Peng**, Hok Sum Fok, Junyi Gong, and Lei Wang (2020). Improving Stage-Discharge Relation in The Mekong River Estuary by Remotely Sensed Long-Period Ocean Tides. *Remote Sensing*.

Presentations

[1]. **Hongrui Peng** and Jiangtao Li (2023/6, Oral, in Chinese). Improved attenuation tomography method based on ambient noise cross-correlation. Invited talk. South University of Science and Technology of China, Shenzhen, China. (Presented by my advisor Jiangtao)

[2]. **Hongrui Peng** and Jiangtao Li (2023/4, Online Oral). An improved attenuation tomography method based on ambient noise cross-correlation. EGU General Assembly 2023, Vienna, Austria.

[3]. **Hongrui Peng** and Jiangtao Li (2023/4, Oral, in Chinese). Ambient noise attenuation tomography method and its application to NE China. Congress of China Geodesy and Geophysics, Wuhan, China.

[4]. **Hongrui Peng** and Jiangtao Li (2022/11, Online Oral, in Chinese). An improved attenuation tomography method based on ambient noise cross-correlation: Tests on the Yellowstone National Park. Annual Meeting of CGU, Online.

Honors and Awards

- **Hongtuchuangzhan Scholarship (∼Top 3%)** 2019
  Sponsored by Wuhan University
- **Suyiguang Scholarship (∼Top 6%)** 2018
  Sponsored by Wuhan University
- **Oustanding Student Scholarship (∼Top 15%)** 2018/2019/2020/2022
  Sponsored by Wuhan University

Additional Activites

- **Winter school exchange student:** Academic writing course, University of Oxford Jan. 2020
- **The student president of Geophysical Union of Wuhan University** 2018 - 2019
- **Student member of AGU and CGU** both since 2021

Technical Skills

- **Languages:** Chinese (Native), English (TOEFL:107)
- **Programing Languages:** MATLAB, Python, Shell, C, R
- **Technical Softwares:** SAC, GMT, SPECFEM2D
- **Document/Presentation:** Office platform, Adobe, Overleaf