Haiyang Liao

🎓 M.S. in NJU, applying for Ph.D. in Seismology

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Education

○ **M.S. in Geological Engineering**   Sept. 2022 - June 2025 (expected)
Nanjing University (US News Ranking: 98), Nanjing, China
- Thesis (in preparation): *Urban karst collapse monitoring technology based on fiber-optic distributed acoustic sensing (DAS)* - Advisor: Professor, Dan Zhang

○ **B.S. in Geology**   Sept. 2018 - June 2022
Anhui University, Hefei, China
- Thesis: *Application of Ground Penetrating Radar (GPR) in surface collapse detection of solid waste deposits in landfill* - Advisor: Associate Professor, Qifeng Yin

Research

Interests

○ **Environmental Seismology**
○ **Urban Near-Surface and Time-Lapse Imaging**
○ **Ambient Seismic Field Interferometry**
○ **DAS Seismology and Interdisciplinary Applications**

Experience and Projects

○ **Shallow Subsurface Cavity Detection**   May 2024 - Present
- Deployed fiber optic cables near campus wells to validate cavity detection with DAS.
- Studied lateral detection ranges using the three-station interferometry method.

○ **Optical Fiber Cable Coupling Methods Study**   May 2024 - Present
- Installed fiber optic cables on campus with different coupling methods to compare imaging effects.

○ **Software Development for Surface Wave Imaging**   Apr 2024 - Aug 2024
- Developed software for monitoring ground collapses using surface waves.

○ **Karst Fracture Zone Detection in Mufu Mountain**   Jan 2024 - Aug 2024
- Laid fiber optic cables and applied frequency-Bessel method to detect fractured karst zones.

○ **Numerical Simulation for Subsurface Cavity Detection**   Jan 2023 - Oct 2023
- Simulated shallow cavities using specfem3d/2d to analyze DAS imaging responses.

○ **DAS and Urban Ground Collapse Research**   Jan 2021 - Dec 2024
- Major focus during master's studies, involving experiments and research with DAS seismology.

○ **Engineering Geological Conditions Evaluation for River-Crossing Tunnels**   June 2023 - Aug 2024
- Served as the student leader, designed experimental plans, coordinated field tests, and co-authored the final report.

Publications

* indicates the corresponding author

Journal Articles

○ **Haiyang Liao**, Dan Zhang*, Kai Lin, and Haoyu Wang. "Urban shallow subsurface void detection using fiber-optic distributed acoustic sensing" in preparation.

○ **Haiyang Liao**, Dan Zhang*, Zhengyu Qian, Hasanjan Yimit, and Qi Luo. "Characterization of shallow karst zones using distributed acoustic sensing and ambient noise tomography: a case study in Mufu Mountain, China" *Engineering Geology*, submitted.

○ Zhengyu Qian, Dan Zhang*, **Haiyang Liao**, and Haoyu Wang. "Can the seismic wave attenuation characteristics of various soils be identified using distributed acoustic sensing?" *Journal of Applied Geophysics* 221 (2024): 105281.

Conferences

- 11/2024 "Utilizing distributed acoustic sensing to reveal shallow karst development areas" presented at the 1st Distributed Fiber Optic Sensing Technology and Application Conference in Nanjing, China.
- 09/2024 Attend at the 12th China Optical Fiber Sensing Conference, Chongqing, China.
- 08/2024 Training and learning at the 10th Summer School on Algorithms and Programs in Seismology, Online Learning.
- 08/2023 Training and learning at the 9th Summer School on Algorithms and Programs in Seismology, Hohhot, China.
- 04/2023 Attend at the National Annual Conference on Engineering Geology, Nanjing, China.

Patents

- **Haiyang Liao**, Dan Zhang, Bin Shi, and Haoyu Wang. "A Multi-parameter Monitoring Device for Karst Development Drilling Holes" *CN Utility Model*, 2024, current status: pending submission.
- **Haiyang Liao**, Dan Zhang, Zhengyu Qian, Hasanjan Yimit, and Qi Luo. "Distributed fiber optic sensing surface wave imaging system" *CN Computer Software Copyright*, 2024, 2024SR1195965. *pdf*

HONORS AND AWARDS

Outstanding Graduate Student Cadre, Nanjing University	2024
Outstanding Member of the Communist Youth League, Nanjing University	2024
Star of the Advanced Computational Engineering Institute for Earth Environment (ACEI), NJU	2023
Outstanding Volunteer at the National Annual Conference on Engineering Geology	2023
Outstanding Member of the Communist Youth League, Anhui University	2021

SKILLS

- Languages: Chinese (Native), English (TOEFL: preparing).
- Programming Languages: Python, Matlab, Shell.
- Technical Softwares: MASW, CC-FJpy, evodcinv, specfem3d/2d, GMT.
- Document / Presentation: LaTeX, Markdown, HTML, Office, Adobe.