Hongyu Xiao

Ph.D. | The Department of Geology | University of Illinois at Urbana–Champaign | Email: Hongyux2@illinois.edu

Education

Ph.D. in Geophysics/Geology, University of Illinois Urbana-Champaign, 2023 Advisor: Dr. Xiaodong Song

M.S in Geophysics/Physics, University of Chicago, 2016 Advisor: Dr. Douglas MacAyeal

B.E.S in Geological Engineering, China University of Petroleum, Beijing, 2014

Honor Program, Top 5 Graduates

Relevant Experience

Research Assistant, University of Illinois Urbana-Champaign, Geology Department **August 2017-August 2022**

- Applied a revised receiver function analysis in central and north midcontinent of U.S. and constructed high-resolution Moho depth maps.
- Built a high-resolution joint inversion seismic tomography model of the midcontinent of the United States with revised receiver functions and ambient noise surface wave data.
- Built deep learning models on receiver function denoising and applied models in the central midcontinent of U.S.

Research Assistant, University of Chicago, Department of the Geophysical Sciences **Sept 2015-Sept 2016**

- Built a 3-layer neural network model of early earthquake warning system based on historical seismicity records.
- Managed large datasets of historical seismic records for supervised training and performed data cleaning, preprocessing, and feature design.

Graduate Student Intern, the Illinois Geological Survey

May 2022- August 2022/ August 2023-December 2023

- Conducted a comprehensive hedonic analysis on real estate properties and geothermal heat pump installations and conducted statewide surface geological mapping with diverse datasets.
- Developed a Raspberry Shake based HVSR tool for horizontal-to-vertical spectral ratio (HVSR) and depth-to-bedrock analysis in Illinois.

Publications

- Xiao, Hongyu, et al. "Crustal Thickness Variations in the Central Midcontinent, USA, and Their Tectonic Implications: New Constraints Obtained Using the H-κ-c Method." *Geophysical Research Letters* 49.17 (2022): e2022GL099257.

- (In prep) Xiao, Hongyu, et al. " Assessing Variations in Crustal Thickness Beneath the Basins and Arches of the Northern Midcontinent, USA: Implications for Basin Initiation, Evolution and Tectonic Assemblage History. "

- (In prep) Xiao, Hongyu, et al. " Joint Inversion of Surface Wave Dispersions and Receiver Functions in The Central Midcontinent of The United States: Implications for the Central Midcontinent of the USA "

- (In prep) Balakian, Riley & Xiao, Hongyu " Horizontal to Vertical Spectral Ratio (HVSR) Analysis with SPRITE: An Open-Source Python-Based Software for Accurate Bedrock Interpretation "

- (In prep) Xiao, Hongyu et al., " Deeping Learning Based Denoising for Estimating Crustal Thickness and Vp/Vs Ratio in the midcontinent of U.S. "

Conference Presentations

- (**Invited Talk**) Topic: Continental-Interior Deformation Deeper Down: Hints of Crustal Buckling and Trans-Crustal Shear Zones in the Cratonic Platform, Midcontinent USA
  Stephen Marshak**, Hongyu Xiao,** Benjamin Murphy**,** Michael DeLucia**,** Xiaodong Song
  GSA Annual Meeting in Pittsburgh, Pennsylvania, USA – 2023

- Topic: SPRIT HVSR: An Open-Source Software Package in Python for Processing, Analyzing, and Visualizing Ambient Seismic Vibrations
  Riley Balikian, **Hongyu Xiao,** Alexandra Sanchez
  GSA Annual Meeting in Pittsburgh, Pennsylvania, USA - 2023

- Topic: The Varying Crustal Thickness Underneath the Cratonic Basins in the Midcontinent of USA and its Implications: New Insights Using the H-κ-c Method
  H Xiao, MS DeLucia, X Song, S Marshak
  AGU Fall Meeting 2022

- Topic: Surface Wave Tomography from Ambient Noise in Central U.S. and its Implications for Illinois Basin and New Madrid Seismic Zone
  H Xiao, X Song, S Marshak
  GSA Annual Meeting in Indianapolis, Indiana, USA - 2018

Professional / Teaching Experience

Teaching Assistant, University of Illinois Urbana-Champaign, Geology Department **August 2017-August 2022**

Lab teaching instructor for multiple undergraduate level courses:

- Planet Earth / Physical Geology / Mineralogy and Mineral Optics / Structural Geology and Tectonic

Program instructor, University of Chicago **Sept. 2016- April. 2017**

- Design and deliver STEM courses with Argonne National Laboratory incorporating cutting-edge research and hands-on learning experiences to under-privileged students and promote a deeper understanding of key scientific concepts.

Professional Service

Student Member, UIUC Geology Climate Working Group, 2021-present

Vice President, UIUC Geology Graduate Student Council, 2020-2021

Honors and Awards

Teachers Ranked as Excellent by Their Students, 2022
Teachers Ranked as Excellent by Their Students, 2021
Jackson Graduate Research Awards, 2020
Teachers Ranked as Excellent by Their Students, 2019