Shuhao Song

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🎓 Education

Southern University of Science and Technology (SUSTech), Shenzhen, China   2022 – 2025
MSc in Geophysics (under *Xiaofei CHEN*), GPA: **3.85** / 4.0

University of California, Berkeley (UCB), California, America   2021 – 2022
Exchange Student in the BISP program, Specialized GPA: **4.0** / 4.0

Southern University of Science and Technology (SUSTech), Shenzhen, China   2018 – 2022
BSc in Geophysics, GPA: **3.83** / 4.0 (1/12)

👥 SPECIALIZED COURSES

- *Math*: Mathematical Analysis; Linear Algebra; Probability and Statistics; Numerical Analysis

- *Physics*: General Physics; Physics Experiments; Mathematical Methods in Physics; Thermodynamics and Statistical Physics

- *Electronic Engineering*: Fundamentals of Electric Circuits; Signal Analysis and Data Processing

- *Computer Sciences*: Python; Java; Scientific Computing and Programming

- *Mechanics*: CAD; Static and Dynamic Mechanics; Continuum Mechanics

- *Geophysics*: Principle of Geology; Fundamental of Geophysics; Geodynamics; Inverse Problem; Applied Geophysics; Strong Motion Seismology; Quantitative Seismology; Isotopic Tracing; Space Geodetics; Computational Geophysics; General Astronomy; Physics of Earth and Planetary Interiors; Rock Physics

🗄 Representative Honors

Summa Cum Laude at the College of Science (**Top 10 Graduates**)	Jun. 2022
Excellent Graduate for exceptional performance at SUSTech	Jun. 2022
Excellent Graduate at the Department of Earth and Space Sciences	Jun. 2022
Excellent Graduation Thesis for undergraduate students	Jun. 2022
Second Class Merit Student Scholarship for exceptional performance	Nov. 2021
Second Group Prize at the "Innovation Cup" National Geophysical Knowledge Competition	Sep. 2021
Personal Best at the "Innovation Cup" National Geophysical Knowledge Competition	Sep. 2021
Men's Doubles and Singles Champion in the School of Science Badminton Tournament	Sep. 2021
Team Champion of the Volleyball Event at the School Sports Festival	Sep. 2020

📄 Publication

[1]. **Shuhao Song**, Zhengbo Li, Juqing Chen, Fengjiang Ju, Chunquan Yu, and Xiaofei Chen. Refine Shallow V_s Model of Complex Subsurface Structures by F-J Multimodal Tomography with Partition Similarity Test: A Case Study at San Jacinto Fault Zone. (Submitted to *Seismological Research Letters*, under review)

💬 Conference

[1]. **Shuhao Song**, Zhengbo Li, Xiaofei Chen. The Effects of Non-linear Cross-correlation Function Stacking Methods on F-J Dispersion Curve Extraction. 2023 AGU Fall meeting, San Francisco, US. (2023/12, Highlighted Poster)

📕 RESEARCH EXPERIENCE

Enhancing the Applicability of the F-J Method for Fault Zone Subsurface Tomography

Individual Project under the supervision of *Prof. Xiaofei CHEN*   May. 2023 – Sep. 2024

- **Objective:** Developed an innovative partitioning strategy to improve surface wave tomography (*SWT*) for complex subsurface structures.
- **Research Actions:**
  - Initially applied the traditional F-J method to a dense seismic array, aiming to refine a complex fault system, but observed bifurcated dispersion curves due to improper array subdivision.
  - Identified the cause through numerical experiments and theoretical analysis, proposing a dispersion similarity-based partitioning strategy to resolve bifurcation without increasing manual workload.
  - Achieved high-resolution imaging of the surveyed fault system's subsurface structure using the modified F-J method.

Exploration of Non-linear Cross-correlation Stacking Methods for the F-J Method

Individual Project under the supervision of *Prof. Xiaofei CHEN* and *Dr. Zhengbo LI*   Dec. 2021 – Jul. 2023

- **Objective:** Investigated the impact of various non-linear cross-correlation stacking methods on F-J surface wave tomography.
- **Research Actions:**
  - Analyzed and classified existing non-linear stacking methods, selecting Phase-Weighted Stacking (*PWS*), Root-Mean-Square Ratio Selection Stacking (*RMSS_SS*), and Frequency Domain Probability Stacking (*FPS*) as representatives for further study.
  - Incorporated these stacking methods into a Python package for the F-J method.
  - Applied the methods to USArray data, finding *FPS* to significantly improve dispersion curve quality, while *PWS* was the least effective.

Numerical Simulation of Fluid Waves in Earth's Outer Core

Undergraduate Research Project under the supervision of *Prof. Yufeng LIN*   Jul. 2020 – Jan. 2022

- **Objective:** Simulated Magnetic–Archimedes–Coriolis (*MAC*) waves to model fluid dynamics in Earth's outer core.
- **Actions:**
  - Derived the governing equations for *MAC* waves based upon the geodynamo model, utilizing spherical harmonic analysis.
  - Developed Matlab code for numerical solutions and performed simulations on a supercomputer to study geomagnetic variations.
  - Identified similar patterns in the sixth and seventh eigenmodes by comparing simulation results with satellite geomagnetic data (CHAOS-7).

🕴 TEACHING EXPERIENCE

Tutored a high school senior in mathematics for college entrance exam (in Mandarin)	2022-2023
Tutored a native American high school student in AP Physics (in English)	2024-Present

⚙ SKILLS

- **Programming Languages**: Matlab, Python, Java, C++
- **Language Proficiency**: Mandarin (Native speaker), English (C1, IELTS-7.5)
- **Technical Softwares**: SAC, GMT, Surfer, Origin
- **Document/Presentation**: Office, Adobe, Overleaf
- **Sports**: Badminton (Proficient), Volleyball (Conversant)