

# SHUHAO SONG

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· 📍 Southern University of Science and Technology, Shenzhen, China, 518055 ·

## 🎓 EDUCATION

<b>Southern University of Science and Technology (SUSTech)</b> , Shenzhen, China	2022 – 2025
<i>MSc</i> in Geophysics (under Xiaofei CHEN), GPA: <b>3.85</b> / 4.0	
<b>University of California, Berkeley (UCB)</b> , California, America	2021 – 2022
<i>Exchange Student</i> in the BISP program, Specialized GPA: <b>4.0</b> / 4.0	
<b>Southern University of Science and Technology (SUSTech)</b> , Shenzhen, China	2018 – 2022
<i>BSc</i> in Geophysics, GPA: <b>3.83</b> / 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

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

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### 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

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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

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- **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)