Zhuo Liu

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Personal Information

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Employment

Stanford University, Stanford, CA Mar. 2025 – Present
Doerr School of Sustainability, Earth and Planetary Science Department
Postdoctoral Scholar with Stanford Mineral-X Initiative
Principal Investigator: Dr. Jef Caers

Education

Colorado School of Mines, Golden, CO Jan. 2019 – Dec. 2024
Department of Geophysics
Ph.D., major in Geophysics, advisor: Dr. Yaoguo Li GPA: 3.57/4
Minor in Geology, advisor: Dr. Thomas Monecke
Dissertation Title: *Magnetic inversions constrained with geological information: An investigation using regularized inversion and machine learning approach.*

Colorado School of Mines, Golden, CO Sept. 2016 – Dec 2018
Department of Geophysics
M.Sc., major in Geophysics, advisor: Dr. Yaoguo Li GPA: 3.56/4
Dissertation Title: *Effects of anisotropic magnetic susceptibility in data interpretation and its potential in application*

Central South University, Changsha, Hunan, China Sept. 2011 - June 2015
School of Geoscience and Info-Physics
B.Sc., major in Applied Geophysics GPA: 3.29/4

Research Interests

My research mainly focuses on exploiting the information contained in the potential field and electromagnetic data sets and fostering geological interpretation by geophysical data interpretation approaches. I am particularly interested in enhancing the interpretation quality of geophysical data through both inversion and machine learning methods for multi-physical properties. I am also interested in incorporating conceptual prior information into inversion assisted by machine learning approaches. Additional research interest is in the topics of using trained neural networks as inverse operators or assistants for decision-making.

Peer-reviewed Paper

1、 **Zhuo Liu** and Yaoguo Li, "Connect Geophysical Data Interpretation and Geology Through Inversion for Anisotropic Magnetic Susceptibility." Submitted to *Geophysical Prospecting*.
2、 **Zhuo Liu**, Yaoguo Li, and Kaijun Xu, "Constrained Simultaneous Recovery of the Depth to Basement and Lateral Susceptibility Variation." *Geophysical Prospecting* 72, no. 8 (2024): 3008-3025.
3、 **Zhuo Liu** and Yaoguo Li, "*Simultaneous Imaging of Basement Relief and Varying Susceptibility Using Trained Deep Neural Network*" Submitted to *Geophysics*

Conference Presentations

1. **Zhuo Liu*** and Yaoguo Li. "Simultaneous imaging of basement relief and varying susceptibility in deep-learning approach." In The International Meeting for Applied Geoscience & Energy. SEG & AAPG, 2024.
2. **Zhuo Liu***, Yaoguo Li, and Kaijun Xu. "Magnetotelluric Constrained Simultaneous Recovery of the Depth to Basement and Lateral Susceptibility Variation." In The International Meeting for Applied Geoscience & Energy. SEG & AAPG, 2024
3. **Zhuo Liu*** and Yaoguo Li. "Inversion for anisotropy magnetic susceptibility." In SEG International Exposition and Annual Meeting, p. D031S028R007. SEG, 2020.
4. **Zhuo Liu*** and Yaoguo Li. "Effects of anisotropic magnetic susceptibility in data interpretation and potential in application." In International Workshop on Gravity, Electrical & Magnetic Methods and Their Applications, Xi'an, China, May 19–22, 2019, pp. 351-354. Society of Exploration Geophysicists and Chinese Geophysical Society, 2019.
5. **Zhuo Liu*** and Yaoguo Li. "Effect of anisotropic magnetic susceptibility and potential applications." In SEG International Exposition and Annual Meeting, pp. SEG-2018. SEG, 2018

Teaching Experience

Colorado School of Mines Golden, CO

Advanced Gravity and Magnetic Exploration (GPGN 411/511) Fall 2023

- Teach the inversion section regarding the Tikhonov regularized inversion and Newton method.
- Grade homework and exam assignments.

Physics of Earth I (GPGN 328) Fall 2022

- Host review sessions for each section and before exams.
- Teach the vector multiplication section.
- Grade homework and exam assignments.

Field Experience

Economy Geology (GEOL 524) class field trip to Edgar Mine at Idaho Springs, CO, USA Nov 2019

- Map mineral occurrence and structural trend in the tunnel.

Hydrothermal Geochemistry (GEOL 513) class field trip to Steamboat Springs, CO, USA Mar 2019

- Sampling geothermal fluid and perform pH, Eh, conductivity, and alkalinity analyses on site.

CSEM data collection in Songliao Basin near Biacheng, Jilin, China July 2017

- Collect data and perform data quality examination on site.

Professional Skills

Software: Adobe Photoshop, Microsoft Office, Mathematica, Geosoft Oasis Montaj, Esri ArcGIS

Coding Language: MATLAB, Python

Honor and Awards

Meng Ersheng Endowed Scholarship Nov 2024

By the Department of Geophysics, Colorado School of Mines

Excellent Graduate of Hunan Province Jun 2015

By the Education Department of Hunan Province

Top Ten Student of Central South University May 2014

By Central South University

Outstanding student Nov 2013

By the School of Geoscience and Info-Physics

First-Class Laurel Geophysics Scholarship Nov 2013

By Laurel Technologies Co Ltd