Xiaolong Wei

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Education

2018–Present	**Ph.D in Geophysics**, University of Houston, Houston, USA
2015–2018	**M.S. in Geology**, Northwest University, Xi'an, China
2011–2015	**B.S. in Geophysics**, China University of Geosciences, Beijing, China

Research Interests

- Geophysical inverse problems for multiple data sets (e.g., gravity, gravity gradiometry and magnetic)
- Structural similarity constraint joint inversion
- Uncertainty analysis in geophysical separate/joint inversions in both deterministic and stochastic frameworks
- Geology differentiation models
- Machine/deep learning algorithms applied to geophysical data interpretations

Awards & Honors

2021	SEG Technical Program Registration Grant
2021	John R. Butler Jr. Scholarship from SEG
2021	The Best Poster in the Mining Sessions at the 2020 SEG Annual Meeting
2020–2021	Outstanding Academic Achievement, University of Houston, Houston, USA ($\times$2)
2016–2018	The First Prize Scholarship, Northwest University, Xi'an, China ($\times$3)
2015	The Best Bachelor Thesis, China University of Geosciences, Beijing, China
2013	The Second Prize Scholarship, China University of Geosciences, Beijing, China
2012	Outstanding Volunteer for rural elementary schools, China University of Geosciences, Beijing, China

Publications

Peer-Reviewed

4. Hu, Y., **Wei, X.**, Wu, X., Sun, J., Chen, J., Huang, Y., Chen, J., 2021. A deep learning enhanced framework for multi-physics joint inversion. *IEEE TRANSACTIONS ON NEURAL NETWORKS AND LEARNING SYSTEMS*. under review

3. **Wei, X.** and Sun, J., 2021. Uncertainty analysis of 3D potential-field deterministic inversion using mixed L p norms. *Geophysics*, 86(6), pp.1-103.

2. Sun, J., **Wei, X.**, 2020. Recovering sparse models in 3D potential-field inversion without bound dependence or staircasing problems using a mixed Lp-norm regularization. *Geophysical Prospecting*. doi:10.1111/1365-2478.13063.

1. Sun, J., Melo, A., Kim, J.D. and **Wei, X.**, 2020. Unveiling the 3D undercover structure of a Precambrian intrusive complex by integrating airborne magnetic and gravity gradient data into 3D quasi-geology model building. *Interpretation*, 8(4), pp.1-50. doi:10.1190/INT-2019-0273.1.

In preparation

2. **Wei, X.** and Sun, J., 2021. Uncertainty analysis of 3D geology differentiation models via joint inversion.

1. Li, K., **Wei, X.**, Sun, J., 2021 Mapping critical mineral resources using airborne geophysics, 3D joint inversion and geology differentiation: A case study of a buried niobium deposit in the Elk Creek carbonatite, Nebraska, USA

Conference Proceedings

7. **Wei, X.** and Sun, J., 2021. 3D probabilistic geology differentiation using mixed L p norm joint inversion constrained by petrophysical information. In *IMAGE Technical Program Expanded Abstracts 2021* doi:10.1190/segam2021-3586619.1.

6. **Wei, X.** and Sun, J., 2021. Uncertainty analysis of 3D geophysical inversion using airborne gravity gradient data conditioned on rock sample measurements. In *IMAGE Technical Program Expanded Abstracts 2021* doi:10.1190/segam2021-3586552.1.

5. Hu, Y., **Wei, X.**, Wu, X., Sun, J., Chen, J., Chen, J., Huang, Y., 2021. Deep learning-enhanced multiphysics joint inversion. In *IMAGE Technical Program Expanded Abstracts 2021* doi:10.1190/segam2021-3583667.1.

4. Li, K., **Wei, X.**, Sun, J., 2021. Geophysical characterization of a buried niobium and rare earth element deposit using 3D joint inversion and geology differentiation: A case study on the Elk Creek carbonatite2021. In *IMAGE Technical Program Expanded Abstracts 2021* doi:10.1190/segam2021-3585069.1.

3. **Wei, X.** and Sun, J., 2020. Uncertainty analysis of joint inversion using mixed Lp-norm regularization. In *SEG Technical Program Expanded Abstracts 2020* (pp. 925-929). Society of Exploration Geophysicists. doi:10.1190/segam2020-3428359.1.

2. **Wei, X.** and Sun, J., 2020. Quantifying uncertainties of deterministic geophysical inversions using mixed Lp norms. In *SEG Technical Program Expanded Abstracts 2020* (pp. 1404-1408). Society of Exploration Geophysicists. doi:10.1190/segam2020-3420227.1.

1. Sun, J., Melo, A., Deok Kim, J. and **Wei, X.**, 2020. Characterizing a Precambrian intrusive complex by integrating potential field data into 3D quasi-geology model building. In *SEG Technical Program Expanded Abstracts 2020* (pp. 1374-1378). Society of Exploration Geophysicists. doi:10.1190/segam2020-3428385.1.

Reviewers

2021–present Acta Geophysica

Professional Affiliations & Activities

2020– Contributor of joint inversion code in SimPEG (https://simpeg.xyz/)

2020–Present American Geophysical Union (AGU)

2020–Present European Association of Geoscientists & Engineers (EAGE)

2018–Present Society of Exploration Geophysicists (SEG)

Teaching Experiences

2020 GEOL7330: Potential Field Methods of Geophysical Exploration (graduate core course), **guest lecturer**, University of Houston

2019 GEOL4355: Geophysical Field Camp, **teaching assistant**, University of Houston

Certifications

2021 Magnetotellurics (MT) short course given by Dr. Alan G. Jones.

2018 Certificate signed by Prof. Andrew Ng upon successfully completing the online machine learning course provided by Stanford University through Coursera Inc.