

Yi Zhang

CONTACT INFORMATION

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EDUCATION

China University of Geosciences, Wuhan, China
M.D–Ph.D., Geophysics, September 2013–Present
B.S., Geophysics, June 2012

Huazhong University of Science and Technology, Wuhan, China
B. S., Architectural Design (Minor), June 2012

FELLOWSHIP

United States Geological Survey, Menlo Park, California
Visiting Scholar, Geophysics, September 2016–Present

HONORS AND AWARDS

- Rui Ming alumni scholarship of the CUG, 2018
- China national scholarship for outstanding Ph.D. student, 2017
- Full scholarship from China Scholarship Council for abroad academic visiting, 2016
- Hua Rui alumni scholarship of the CUG, 2015
- Outstanding student report of the Chinese Geophysical Society Annual Meeting, 2014
- Second Prize of the science and technology report competition of the CUG, 2013
- Hua Rui alumni scholarship of the CUG, 2013
- Outstanding undergraduate graduate of the CUG, 2012

INVOLVED SCIENTIFIC PROJECTS

- International cooperation with Colorado School of Mines and Geoscience Australia Development of algorithms for inverting large-scale gravity and magnetic data in spherical coordinates, 2012–2013 | theory and program development | Adviser: Chao Chen
- 3D multi-density structure of the lunar lithosphere: implication to the evolution of the crust and the mantle of the Moon (Chinese Natural Science for Youth Foundation), 2013–2015 | theory and program development | Adviser: Liang Qing, Chao Chen
- Inversion theory of large-scale magnetic distribution of the lithosphere (Chinese Natural Science for Youth Foundation), 2015 – 2016 | theory and program development | Adviser: Jinsong Du, Chao Chen
- Theoretical study on 3D density imaging of the Earth's mantle under the spherical coordinates (Natural Science Foundation of China), 2016–Present | theory and program development | Adviser: Chao Chen

RELEVANT WORK EXPERIENCE

- Graduate Teaching Assistant in the Earth's Gravitational Field, Institute of Geophysics and Geomatics, CUG, 2016
- Undergraduate Teaching Assistant in Geophysics, Institute of Geophysics and Geomatics, CUG, 2015–2016

FIELD WORK EXPERIENCE

- Deployment of seismic reflection profile, Fermont, CA | Adviser: Walter Mooney
- Deployment and servicing of absolute gravimeter stations at the Three Gorges area, Hubei, China. CUG, 2013–2016 | Adviser: Chao Chen, Linsong Wang

- Regional geological survey of the Western Junggar Area, Xinjiang, China (gravity and magnetic). China Geological Survey, 2015–2016 | Adviser: Guocang Wang, Chao Chen
- Regional geological survey of the Barkul Basin, Xinjiang, China (gravity and magnetic). China Geological Survey, 2016 | Adviser: Guocang Wang, Chao Chen

INTERNSHIPS

- Summer internship, School of Earth Sciences, CUG, July 2010
Course: Geological Survey at the Three Gorges area
- Summer internship, Institute of Geophysics and Geomatics, CUG, July 2011
Course: Applied Geophysics Seminar and Field Course (seismic, gravity, magnetic and resistivity)

FUNDED GRANT PROPOSALS

- Student Travel Grant, Math + X Symposium on Seismology and Inverse Problems, Huston, Texas, 2017
- Student Travel Grant, the Gordon Research Conferences of the chemical and dynamic evolution of Earth's deep interior, South Hadley, Massachusetts, 2017

WORKSHOP AND MEETINGS

- AGU Fall Meeting, Washington D.C., 2018
- AGU Fall Meeting, New Orleans, Louisiana, 2017
- Math + X Symposium on Seismology and Inverse Problems, Huston, Texas, 2017
- Gordon Research Conferences: Interior of the Earth, South Hadley, Massachusetts, 2017
- AGU Fall Meeting, San Francisco, California, 2016
- AGU Fall Meeting, San Francisco, California, 2015
- Chinese Geophysical Society Annual Meeting, Beijing, China, 2015
- Chinese Geophysical Society Annual Meeting, Beijing, China, 2014

AREAS OF SPECIALIZATION

- 3D model constructions
- Forward and inversion techniques of gravitational field
- Inverse theory
- Numerical simulation
- Computational Geophysics

PUBLICATIONS AND TALKS

JOURNAL ARTICLES

- Zhang, Y.**, Mooney, W. D., Chen, C. and Du, J. (2019). Interface inversion of gravitational data using spherical triangular tessellation: An application for the estimation of the Moon's crustal thickness. *Geophysical Journal International* (Accepted).
- Zhang, Y.**, Mooney, W. D., and Chen, C. (2018). Forward calculation of gravitational fields with variable resolution 3d density models using spherical triangular tessellation: Theory and Applications. *Geophysical Journal International*, 215(1):363–374. <https://doi.org/10.1093/gji/ggy278>
- Zhang, Y.**, and Chen, C. (2018). Forward calculation of gravity and its gradient using polyhedral representation of density interfaces: an application of spherical or ellipsoidal topographic gravity effect. *Journal of Geodesy*, 92(2), 205-218. <https://doi.org/10.1007/s00190-017-1057-3>
- Zhang, Y.**, Zhang, SX., Liang, Q. & Chen, C. (2015). Application of boundary identifying technologies using gravity and magnetic maps in 3-D geological mapping of the Western Junggar Area. *Earth Science*, 40(3), 431~440 (in Chinese).

CONFERENCE PRESENTATIONS

- Zhang, Y.**, Mooney, W. D., and Chen, C., Forward and inverse techniques for gravity data using the spherical triangular tessellation. The AGU Fall Meeting, 2018, Washington D.C., USA. [poster]
- Zhang, Y.**, and Chen, C., Forward calculation of gravity and its gradient using polyhedral representation of density interfaces: an application of spherical or ellipsoidal topographic gravity effect. The Gordon Research Conferences: Interior of the Earth, 2017, South Hadley, Massachusetts, USA. [poster]
- Sun, K., Chen C., **Zhang, Y.**, Comprehensive Geophysical Interpretation – the Thickness Draft of the Cenozoic Sedimentary Layers in Barkul Basin, Xinjiang, China. The AGU Fall Meeting, 2016, San Francisco, CA, USA. [poster]
- Zhang, Y.**, Chen, C., Du, JS., Shun, SD., and Liang, Q., Forward modelling method of potential fields using unstructured grid in the Cartesian and spherical coordinates. The AGU Fall Meeting, 2015, San Francisco, CA, USA. [poster]
- Zhang, Y.** and Chen, C., Forward modeling method of potential fields based on 3-D Delaunay subdivision. The Chinese Geophysical Society Annual Meeting, 2015, Beijing, China. [talk].
- Zhang, Y.**, Zhang, SX., Liang, Q. & Chen, C., Application of boundary identifying technologies using gravity and magnetic maps in 3-D geological mapping of the Western Junggar Area. The Chinese Geophysical Society Annual Meeting, 2014, Beijing, China. [talk].

INVITED TALKS

- “Gravity map and deduced linear structures of the West Juggar Area, Xinjiang, China deduced from gravity map”, September 2015, Karamay, Xinjiang, China (Host: School of Earth Sciences, CUG)
- “Characteristics of the Bouguer gravity anomalies of the Guangxi Province, China”, March 2016, Liu Zhou, Guangxi, China (Host: Guangxi Geological Survey)
- “Forward and inverse techniques of gravitational data using the spherical triangular tessellation”, November 2018, Menlo Park, CA (Host: Walter Mooney)

COMPUTER SKILLS

PACKAGES DEVELOPED

- `fracModel` | Synthetic data generator in 2D and 3D dimensions using the Cartesian or the spherical coordinates. The model is grown from several random seeds following a fractal algorithm, providing regional variations and local details. (C++ with openMP)
- `gmshinfo`, `gmshset` | Gmsh (.msh) file inspector and model elements' property assignment according to tags of physical groups. (C++)
- `stt` | Spherical triangular tessellation generator using the spherical coordinates. The grid is constructed based on an icosahedron with options of complex structural refinements over points, trajectories and polygons. Cutting holes and subtracting partial regions. (C++ with openMP)
- `pyplot` | Collection of python scripts for quick data plotting based on the Matplotlib. (Python)
- `gmtplot` | Collection of shell scripts for quick data plotting based on the GMT. (Shell)

PROGRAMMING

Advanced: C++ | Intermediate: Python, Matlab, Shell scripting | Basic: Java scripting, HTML

MODELING

Finite Element: Gmsh

Visualization: Gmsh, Paraview, Meshlab

MISCELLANEOUS

Document Preparation: LaTeX, Microsoft Office

Operation Systems: Unix/Linux, MacOS, Windows

Graphics: GMT, Matplotlib, Illustrator

Distributed version control: Github