Diego Domenzain PhD

Colorado School of Mines
Geophysics
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USA

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Selected Attributes

Programming experience in Matlab, Python, TensorFlow, PyTorch, Julia, Bash, C & **scientific, parallel and cloud computing**.

Algorithm development of novel imaging techniques using radar and DC currents. From numerical discretization of Maxwell's equations to **joint non-linear optimization**.

Research scientist of electromagnetic & seismic data in the time and frequency domain.

Application and development of **iterative image processing** techniques.

Education

Boise State University (BSU)
Ph.D. Geophysics
Dissertation: *Joint inversion using electromagnetic waves and steady currents*

Michigan Technological University (MTU)
MSc. Discrete Mathematics
Dissertation: *Maximal arcs, above and beyond*

Professional Activities

Colorado School of Mines. 2019 - present.
Postdoctoral Researcher
Enhancing geo-radar imaging techniques with machine learning and full-waveform inversion.

Boise State University. 2018 - 2019.
Teaching Assistant

Statistical Methods for Geoscience (Graduate)

Geophysical Methods (Graduate/Undergraduate)

Geophysical Instrumentation (Graduate/Undergraduate)

Natural Disasters: A Geoscience Perspective on Natural Hazards, Climate Change, and Society (Undergraduate)

TU-Delft. 2018.
Visiting Scholar
Academic visit to TU-Delft under the supervision of Evert Slob and Dominique Ngan-Tillard.

Boise State University. 2015 - 2018.
Research Assistant
National Science Foundation (NSF) fully funded project for the development of a joint inversion algorithm using *ground penetrating radar* (GPR) and *electrical resistivity* (ER) data for imaging electrical properties in the Earth's subsurface.

Michigan Tech. 2012 - 2014.
Teaching Assistant

Calculus I (Undergraduate)

Calculus III (Undergraduate)

Calculus IV (Undergraduate)

Publications

Joint inversion of full-waveform inversion GPR and ER data. Part 1. Geophysics 85, no.6 (2020): 1-72. Diego Domenzain, John Bradford, Jodi Mead.

Joint inversion of full-waveform inversion GPR and ER data. Part 2. Geophysics 85, no.6 (2020): 1-74. Diego Domenzain, John Bradford, Jodi Mead.

Efficient inversion of 2.5D electrical resistivity data using the discrete adjoint method. Geophysics - In review. Diego Domenzain, John Bradford, Jodi Mead.

Conferences & Proceedings

Diego Domenzain, John Bradford, Jodi Mead. *Inversion of 2.5D electrical resistivity data using the discrete adjoint method*. SEG 2020 Fall meeting.

Diego Domenzain, John Bradford, Jodi Mead. *Joint inversion of full-waveform GPR and ER data enhanced by the envelope transform and cross-gradients*. GPR 2020 biannual meeting (postponed for 2022 because of COVID-19).

John Bradford, AR Mangel, D Domenzain. *Reverse-Time Migration and Full-Waveform Inversion of Surface Ground-Penetrating Radar Data*. AGU Fall meeting 2018.

Diego Domenzain, John Bradford, Jodi Mead. *Joint inversion of GPR and ER data using the adjoint method*. AGU Fall meeting 2018.

Diego Domenzain, John Bradford, Jodi Mead. *Joint inversion of GPR and ER data*. SEG Technical Program Expanded Abstracts 2018: pp. 4763-4767. SEG Fall meeting 2018.

Diego Domenzain, John Bradford, Jodi Mead. *Imaging by joint inversion of electromagnetic waves and DC currents*. SIAM-Geosciences meeting 2017.

Diego Domenzain, John Bradford, Jodi Mead. *Imaging by joint inversion of electromagnetic waves and DC currents*. SAGEEP 2017.

Diego Domenzain, John Bradford, Jodi Mead. *Forward modeling of ground penetrating radar (GPR) and electric resistivity tomography (ERT) using finite difference time domain and finite volume methods, first steps for a joint inversion*. AGU Fall meeting 2016.

Attended Workshops

Image Reconstruction from Millimeters to the Globe. Summer 2018. Lorentz Center, Leiden University, NL.

17th International Conference on Ground Penetrating Radar. Summer 2018. Rapperswil, Switzerland.

Inverse problems. Summer 2016. Colorado State University, USA.

Computational and Analytical Aspects of Image Reconstruction. Summer 2015. ICERM, Brown University, USA.

Scholarships

Teaching assistantship. Boise State University. Teaching assistant for graduate course of Statistical Methods covering tuition and stipend.

Research assistanship. Boise State University. Graduate research assistant for the Applied Mathematics NSF funded project DMS-1418714 covering tuition and stipend.

Research assistanship. Boise State University. Graduate research assistant for the Applied Mathematics NSF funded project DMS-1720472 covering tuition and stipend.

Teaching assistantship. Michigan Tech. Teaching assistant for undergraduate course of Calculus I-IV covering tuition and stipend.

Leadership

NOSOTROS-MTU. President of the student organization NOSOTROS at MTU. Organized an entire year of activities, mostly camping around the Keweenaw.

SEG-BSU Student Chapter. President. Directed Python and Git coding workshop. Lead geophysics field survey at the old Idaho Penitentiary cemetery. We found some dead bodies there.

Outreach

Climate change communicator. BSU lead in educational project between SEG Student Chapters at BSU and TU-Delft informing younger generations about climate change challenges and the use of geophysics to solve them.

Didactic inventor. Design of new activities for teaching high mathematical subjects to elementary school children at the Museum of Science in the university's campus.

References

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Donna Calhoun
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