

# Diego Domenzain

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Colorado School of Mines  
Geophysics  
Golden, CO  
USA

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## Selected Attributes

Programming experience in Matlab, Python, TensorFlow, PyTorch, Bash, C and **parallel and scientific 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*

### Universidad Nacional Autónoma de México (UNAM)

BSc. Mathematics

Dissertation: *Surface codes for quantum computing*

## 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.

**CENAPRED.** 2015.

*Seismic Hazards Intern*

Developed seismic tomography software for the 5400m a.m.s.l. volcano Popocatepetl at the mexican *National Center for Disaster Prevension*, CENAPRED in spanish.

**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 - In press. Diego Domenzain, John Bradford, Jodi Mead.

*Joint inversion of full-waveform inversion GPR and ER data. Part 2.* Geophysics - In press. 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.

## Scholarships

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

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

**Research assistantship.** 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.

## 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.

## 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.

## 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.** Fulfillment of my social service requirement at UNAM's science museum *Universum* designing new activities for teaching high mathematical subjects to elementary school children.

## References

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