

Diego Domenzain • PhD geoPhysics & Seismology • MSc Mathematics • BSc Mathematics

AGS • Seequent
Computational Geophysics
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Research scientist specializing in numerical modeling & optimization methods.

As a Mathematician, I dissect problems into intrinsic parts and solve the puzzle by carefully rearranging them into a coherent and efficient machine. Only dreams of reason allowed.

- Numerical modeling of partial differential equations.
- Fortran, C, openMP, Matlab, Julia, Python.
- Scientific, parallel and cloud computing.
- Combinatoric optimization methods.
- Design of non-linear optimization methods.
- Digital signal processing of time series.
- Uncertainty quantification of observed data.
- Iterative image processing techniques.
- Deep learning methods for pic2pic mapping.
- Full-waveform inversion of radar data.

Selected projects

- Guided the development and realization of a new subsurface DCIP monitoring system in partnership with **Ejlskov A/S**: planning instrument tests, enhancing new instrumentation, developing new signal processing routines, and implementing new optimization methods. **Efficiency in data acquisition time, signal processing, computation, and model resolution increased by two orders of magnitude. 2 years.**
- Designed numerical modeling of partial differential equations in 2D & 3D using high performance computing. Specifically for non-homogeneous media, time-domain elastic and electromagnetic waves, and steady state processes (Fortran & openMP, Slurm, Matlab). **+7 years of experience in numerical methods.**
- Developed and implemented non-linear multi-physics optimization algorithms to recover heterogeneous physical properties using electromagnetic data (Fortran & openMP, Slurm, Matlab). **Efficiency in computation and resolution over two orders of magnitude in time, space, and memory than previous research.**
- Implemented numerical methods in the cloud using high performance & parallel computing (Fortran & openMP, Slurm, Matlab). **+4 years of experience.**
- Quantified uncertainty & reduced noise of physically observed data. **From 50% noise to 90% signal in time-domain observed data.**
- Well versed in spoken, visual, and written scientific communication catered to different audiences. **Have attended +10 conferences and published 5 peer reviewed papers as first author.**
- Recipient of National Science Foundation (NSF-US), and Teaching Assistant grants for PhD and Master studies respectively. **Both grants covered full tuition and stipend (~50k usd per year).**
- I enjoy learning and implementing different applied numerical routines (Fortran, C, Matlab, Python, Julia). The site **alles** hosts **+20 projects** ranging from **pic2pic deep learning, covid modeling, Markowitz portfolio, self-organizing maps, graph signal processing, Dijkstra's algorithm, joint inversion & more.**

Work experience

AGS • Seequent 2023

Aarhus University 2021-2023

Colorado School of Mines 2020-2021

Boise State University 2015 - 2019

Michigan Technological University 2012 - 2014

Computational Geophysicist

Post-doctoral Researcher in the Hydro-Geophysics Group

Post-doctoral Researcher in the Geophysics Department

Ph.D. Geophysics & Seismology (GPA 3.76/4)

MSc. & TA. Discrete Mathematics (GPA 3.45/4)

Scientific peer-reviewed publications (selected)

3D DC inversion, visualization, and processing of dense time-lapse data in fine domains applied to remediation monitoring. Geophysics 88, (2023): 1-60. Diego Domenzain, Lichao Liu, Iván Yélamos Vela, Anders Vest.

Joint full-waveform ground-penetrating radar and electrical resistivity inversion applied to field data acquired on the surface. Geophysics 87, (2022): K1-K17. Diego Domenzain, John Bradford, Jodi Mead.

Efficient inversion of 2.5D electrical resistivity data using the discrete adjoint method. Geophysics 86, (2021): 1-54. Diego Domenzain, John Bradford, Jodi Mead.