

Amir Mardan

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RESEARCH INTEREST

- Full Waveform Inversion
- Numerical modeling
- Seismic data interpretation
- Machine learning

EDUCATION

INRS (Québec, Canada) *Sep./2018-Present*
Ph.D. Geoscience
GPA: 4/4

Amirkabir University of Technology (Tehran, Iran) *Sep./2014-Sep./2016*
M.Sc. Petroleum engineering (Exploration seismology)
GPA: 3.83/4

Science and Research Branch of Islamic Azad University (Tehran, Iran) *Sep./2009-Sep./2013*
B.Sc. Petroleum engineering (Exploration)
GPA: 3.75/4

RESEARCH EXPERIENCE

Monitoring CO₂ saturation using time-lapse seismic FWI *Sep/2018-present*
INRS-ETE
Supervisor: *Dr. Bernard Giroux*
Co-supervisor: *Dr. Gabriel Fabien-Ouellet*

Application of pattern recognition in detecting buried channels in seismic data *July/2015-Sep./2016*
Amirkabir University of Technology
Supervisor: *Dr. Abdolrahim Javaherian*

Porosity measurement using NMR well logging *July/2012-July/2013*
Science and Research Branch of Islamic Azad University of Tehran
Supervisor: *Dr. Kamyar Ahmadi*

TEACHING EXPERIENCE

- Autumn 2017, "Software in exploration seismology such as Petrel, OpendTect, and VISTA"
- Autumn 2017, "Reservoir Engineering, Well logging, Geomechanics, and Drilling Engineering"
BSc. students, Islamic Azad University
- Autumn 2016, "Evaluation and estimation of petroleum reservoirs"
BSc. students, Islamic Azad University
- Autumn 2015, "MATLAB and its application in seismology"
MSc. students, Amirkabir University of Technology

WORK EXPERIENCE AND INTERNSHIP

- **Seismic Field Technician**
Geostack (part-time collaboration)
Québec City, QC, Canada *Nov/2021 - present*
- **Lecturer**
Islamic Azad University
Tehran, Iran *Sep/2016 - Jan/2018*
- **NIOC Exploration Directorate**
Tehran, Iran *June/2013 - Sep/2013*

MAJOR GRADUATE COURSES

- Advanced Petroleum Organic Geochemistry
- Digital Filters
- Interpretation of Seismic Reflection Data
- Sedimentary Basin Analysis
- Seismic Data Acquisition
- Seismic Signature in Anisotropic Media
- Seismic Data Processing
- Subsurface Geology
- Finite Element
- Advanced Petrophysics
- Exploration Seismology
- Machine Learning (Online Course)
- Seismic Attributes
- Seismic Inversion for Acoustic Impedance Recovery
- Seismic Rock Physics
- Application of Advanced Rock Mechanics in Petroleum Engineering

TECHNICAL SKILLS

- **Programming language:** Python, JavaScript, MATLAB
- **Machine-learning:** Pandas, TensorFlow, PyTorch, Scikit-learn
- **Version control:** Git, GitHub
- **Software:** Petrel, OpendTect, HampsonRussell, VISTA
- **Web development:** HTML/CSS, jQuery, Node, MongoDB, MySQL

PYTHON COMPETENCE

Python Package

- Numerical analysis:
 - NumPy
 - SciPy
- Data analysis and machine learning
 - Pandas
 - Scikit-learn
 - PyTorch
 - TensorFlow
- PyOpenCL (GPU programming)

Open source contribution

- **PyFWI** (documentation under development)
PyFWI is a Python package I developed for seismic full-waveform inversion (FWI).

PUBLICATIONS

- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Effects of nonrepeatability on time-lapse full-waveform inversion, 83rd EAGE Conference and Exhibition 2022, Madrid.

- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Time-lapse full-waveform inversion for monitoring the fluid saturation, 83rd EAGE Conference and Exhibition 2022, Madrid.
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Time-lapse seismic full-waveform inversion using improved cascaded method, 2nd EAGE Conference On Seismic Inversion, Porto, doi:[10.3997/2214-4609.202229003](https://doi.org/10.3997/2214-4609.202229003).
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2018, Channel detection using unsupervised learning techniques, 80th EAGE Conference and Exhibition 2018, Copenhagen, doi:[10.3997/2214-4609.201800924](https://doi.org/10.3997/2214-4609.201800924).
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2017, The use of self-organizing maps to identify channel facies in one of the Iranian oilfields, Journal of Exploration and Production, 146, 46-51.
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2017, Channel characterization using support vector machine, 79th EAGE Conference and Exhibition 2017, Paris, doi:[10.3997/2214-4609.201701665](https://doi.org/10.3997/2214-4609.201701665).
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2017, Principal and independent components analysis for channel detecting, 3rd Seminar of Petroleum Geophysical Exploration, Tehran.
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2016, Channel detection using unsupervised learning algorithms, The 17th Iranian Geophysical Conference, Tehran.
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2015, A comparison of unsupervised learning techniques for channel detection in 3D seismic data acquired over the Strait of Hormuz, Journal of Research on Applied Geophysics, 1, 2, 90-102.
- **Mardan, A.**, and Javaherian, A., 2015, Improvement of k-means clustering algorithm for fault detection in seismic data, The 3rd National Iranian Petroleum Conference, University of Kerman.

LANGUAGES

- English
- French
- Farsi