

# Amir Mardan

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## RESEARCH INTEREST

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

## EDUCATION

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**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

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**Monitoring CO<sub>2</sub> 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

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- 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

- **Lecturer**  
Islamic Azad University  
Tehran, Iran *Sep/2016 - Jan/2018*
- **NIOC Exploration Directorate (Internship)**  
Tehran, Iran *June/2013 - Sep/2013*

## TECHNICAL SKILLS

- **Programming language:** Python, HTML, C++, 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., **Co-author revision**, PyFWI: A Python package for Full-Waveform Inversion (FWI).
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., **Co-author revision**, Monitoring fluid saturation in reservoirs using time-lapse full-waveform inversion.
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., **Moderate revision**, Weighted-average time-lapse seismic full-waveform inversion, Geophysics.
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., Saberi, M. R., 2022, Direct monitoring of fluid saturation using time-lapse full-waveform inversion, International Meeting for Applied Geoscience & Energy (IMAGE), Houston, Texas.
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Effects of nonrepeatability on time-lapse full-waveform inversion, 83<sup>rd</sup> EAGE Conference and Exhibition 2022, Madrid, doi:[10.3997/2214-4609.202211009](https://doi.org/10.3997/2214-4609.202211009).
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Time-lapse full-waveform inversion for monitoring the fluid saturation, 83<sup>rd</sup> EAGE Conference and Exhibition 2022, Madrid, doi:[10.3997/2214-4609.202210635](https://doi.org/10.3997/2214-4609.202210635).
- **Mardan, A.**, Giroux, B., and Fabien-Ouellet, G., 2022, Time-lapse seismic full-waveform inversion using improved cascaded method, 2<sup>nd</sup> 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, 80<sup>th</sup> 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, 79<sup>th</sup> 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, 3<sup>rd</sup> Seminar of Petroleum Geophysical Exploration, Tehran.
- **Mardan, A.**, Javaherian, A., and Mirzakhani, M., 2016, Channel detection using unsupervised learning algorithms, The 17<sup>th</sup> 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 3<sup>rd</sup> National Iranian Petroleum Conference, University of Kerman.

## **AWARDS**

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| • High-rank presentation at 83 <sup>rd</sup> EAGE Conference and Exhibition                | <i>2022</i> |
| • SEG/Landmark Scholarship for US\$9,465.9   | <i>2022</i> |
| • SEG Foundation Scholarship for US\$534.1   | <i>2022</i> |
| • Ranked 4 <sup>th</sup> in MSc Entrance Exam of Petroleum Exploration Engineering in Iran | <i>2014</i> |

## **LANGUAGES**

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- English
- French
- Farsi