



## Mahdi Bajolvand

### E-mail Addresses:

[mahdibajolvand@shahroodut.ac.ir](mailto:mahdibajolvand@shahroodut.ac.ir)

[mahdibajolvand.phd@gmail.com](mailto:mahdibajolvand.phd@gmail.com)

### ◆ Key Skills

- ◆ Data management
- ◆ Data Science
- ◆ Numerical Modelling
- ◆ Laboratory & Field Works
- ◆ Research & Development (R&D)

### ◆ Programming language

- ◆ MATLAB
- ◆ Python
- ◆ R

### ◆ Numerical Modelling Software

- ◆ FLAC 2D/3D
- ◆ PFC 2D/3D
- ◆ UDEC/ 3DEC
- ◆ ABAQUS

### ◆ Petroleum/Geoscience Software

- ◆ Techlog
- ◆ Geolog
- ◆ Petrel

### ◆ Language

- ◆ Persian (Native)
- ◆ English
  - Reading
  - Listening
  - Writing
  - Speaking

### ◆ Profile Highlights

- Top scientific student and top researcher at different academic degree levels
- More than 5 years of presence as a main collaborator in university-industry joint projects
- Posses familiarity with various numerical methods in solving geomechanical and geotechnical problems.
- Posses familiarity with various Artificial Intelligent (AI) and Optimization algorithms
- Considerable experience in preparing and presenting technical project reports
- Considerable experience in analysis of laboratory and field test results and providing practical solutions.

### ◆ Education

#### ◆ Doctor of Philosophy (Ph.D.)

September 2018- June 2023

Mining Engineering – Rock Mechanics, GPA: 18.25/20 (Class rank 1st)

Shahrood University of Technology, Shahrood, Iran

**Thesis:** “Optimization of controllable drilling parameters based on geomechanical parameters”.

**Skills:** Data preprocessing-Machine Learning-Multi objective optimization

**Industry-supported and funded by National Iranian Drilling Company (Grant No. NIDC98-016)**

#### ◆ Master of Science (M.Sc.)

July 2015- January 2018

Mining Engineering – Tunnel and Underground Spaces, GPA: 17.13/20 (Class rank 2nd)

Shahrood University of Technology, Shahrood, Iran

**Thesis:** “Numerical modelling of the effect of time-dependent behavior of ductile formations on the casing collapse in oil wells”.

#### ◆ Bachelor of Engineering (B.Sc.)

September 2011- August 2015

Mining Engineering – Mining Exploitation, GPA: 16.92/20 (Class rank 2nd)

- Loreastan University – Khoramabad, Iran

### ◆ Work Experiences

#### ◆ Teacher Assistant

September 2018-Present

Faculty of Mining, Petroleum and Geophysics Engineering, Shahrood University of Technology, Shahrood, Iran

**Courses:** Advanced Rock and Soil mechanics, Advanced Geomechanics, Geotechnics

#### ◆ Geomechanics Specialist

October 2020-Present

Asia Geo Petro Tech Company, Shahrood, Iran

**Responsibilities:** Research and development, Technical manager, Data scientist, Technical advisor for software development.

#### ◆ Geomechanics Engineer

September 2018- March 2020

Shahrood University of Technology, Shahrood, Iran

**Responsibilities:** Research and development, writing technical reports

#### ◆ Mining Engineer

February 2018- September 2018

PSM Consulting Company, Shahrood, Iran

- **Responsibilities:** laboratory tests, Field investigations, Writing and presenting technical reports

### ◆ Selected Projects (University-Industry jointed projects)

#### ◆ Development of a software for Fracture zone detection in hydrocarbon reservoirs

May 2023- Present

**Skills:** Data analysis & preprocessing, Classification methods, Technical advisor, MATLAB, Python

#### ◆ Development of Intelligent Drilling data management software

April 2021- June 2022

**Skills:** Technical advisor, Drilling Data (in WITSML format) management, Data analysis, Python

#### ◆ Wellbore stability analysis using geomechanical modeling

September 2020- March 2022

**Skills:** 1D MEM modeling, Data Analysis, Laboratory tests, writing technical reports

#### ◆ Pore pressure prediction using petrophysical logs, rock physics and seismic data

September 2020- January 2023

**Skills:** Data analysis, Laboratory tests, Analytical methods, writing technical reports

#### ◆ Roadmap of developing new geomechanical based technologies

September 2018- December 2018

- **Skills:** Research and Development (R&D)

## ◆ Access to my profile

### ◆ [Linkedin](#)



### ◆ [Google scholar](#)



### ◆ [Scopus](#)



### ◆ [Research gate](#)



## ◆ Honors and awards

### ◆ Top Researcher

October 2022  
Shahrood University of Technology

### ◆ Elite Student

August 2022  
Iran's National Elites Foundation

### ◆ Top scientific student

August 2019  
Shahrood University of Technology

### ◆ Top scientific student

June 2017  
Shahrood University of Technology

### ◆ Talented student

June 2015  
Ministry of Science, Research and Technology

### ◆ Top scientific student

May 2015  
Lorestan University

## ◆ Research interests

### ◆ Energy (oil, gas and geothermal)

- Real-time and Offline wellbore stability analysis
- 1D and 3D THM Coupled geomechanical modelling of hydrocarbon reservoirs
- Optimization of drilling operation in oil, gas and geothermal wells

### ◆ Geo-related hazards analysis in natural and man-made structures

- CO<sub>2</sub>, hydrogen, Compressed air, and natural gas storage in salt cavern and natural structures
- Analysis and predict life-cycle of critical structures/infrastructures under complex loading system
- Slope stability analysis in soft soil, hard rocks or jointed rock mass
- Tunneling in soft soils, hard rocks or jointed rock mass

### ◆ Digital transformation in upstream energy sector

- Design and optimization of oil, gas and geothermal wells (on/offshore) drilling operation.
- Design and optimization of mining operations

## ◆ Journal Papers

### ◆ [Predicting uniaxial compressive strength from drilling variables aided by hybrid machine learning](#)

S Davoodi, M Mehrad, DA Wood, VS Rukavishnikov, M Bajolvand  
International Journal of Rock Mechanics and Mining Sciences, 2023

### ◆ [Developing a new model for drilling rate of penetration prediction using convolutional neural network](#)

M Matinkia, A Sheykhinasab, S Shojaei, A Vojdani Tazeh Kand, A Elmi, M Bajolvand, M Mehrad  
Arabian Journal for Science and Engineering, 2022

### ◆ [Optimization of controllable drilling parameters using a novel geomechanics-based workflow](#)

M Bajolvand, A Ramezanzadeh, M Mehrad, A Roohi  
Journal of Petroleum Science and Engineering, 2022

### ◆ [Estimating shear wave velocity in carbonate reservoirs from petrophysical logs using intelligent algorithms](#)

M Mehrad, A Ramezanzadeh, M Bajolvand, MR Hajsaeedi  
Journal of Petroleum Science and Engineering, 2022

### ◆ [A novel approach to pore pressure modeling based on conventional well logs using convolutional neural network](#)

M Matinkia, A Amraeiniya, MM Behboud, M Mehrad, M Bajolvand, M.H Gandomgoun, M Gandomgoun  
Journal of Petroleum Science and Engineering, 2022

### ◆ [Modeling the Effect of the Striker Geometry on the Wave Propagation Pattern in the Split-Hopkinson Pressure Bar Test Using the Discrete Element Method](#)

M Nikkhah, M Bajolvand  
International Journal of Mining and Geo-Engineering, 2022

### ◆ [Developing a new rigorous drilling rate prediction model using a machine learning technique](#)

M Mehrad, M Bajolvand, A Ramezanzadeh, JG Neycharan  
Journal of Petroleum Science and Engineering, 2020

### ◆ [Impact of Salt Formation's Geomechanical properties on the casing collapse event in oil wells using Numerical modeling](#)

M Bajolvand, A Ramezanzadeh  
Journal of Petroleum Geomechanics, 2018

### ◆ [Investigate the effect of rock mass joint intensity on performance of support systems in the tunnel by using DFN-DEM numerical modeling \(Case study: the access tunnel of Rudbar lorestan Dam plant](#)

M Noroozi, R Rafiee, M Bajolvand, A Hojjati  
Journal of Analytical and Numerical Methods in Mining Engineering, 2018

## ◆ Conference Papers

### ◆ [Estimating the torque on bit in oil and gas wells drillig operation using an artificial neural network](#)

M Bajolvand, A Ramezanzadeh, M Mehrad, A Roohi  
1st international conference on artificial intelligent, data mining and digital transformation in oil and gas industry, Tehran, Iran, 2023

### ◆ [A Review of the application of numerical methods in Thermo-Hydro-Mechanical \(THM\) modeling of improved and enhanced recovery of hydrocarbon reservoirs](#)

M Bajolvand, S Zare  
3rd Iranian National Conference on Petroleum Geomechanics, Tehran, Iran, 2019

### ◆ [Numerical Modeling of the Effect of Time-dependent Behaviors of Salt Formations on the Casing Collapse of oil Wells](#)

M Bajolvand, A Ramezanzadeh  
9th Conference on the Mechanical Behavior of Salt (SALT MECH IX), Hannover, Germany, 2018

### ◆ [Numerical modeling of long-term base performance in room-pillar salt rock mining under the influence of salt creep behavior](#)

M Bajolvand, A Ramezanzadeh  
12th Iranian and 3rd regional Tunneling Conference, Tehran, Iran, 2018