



## CURRICULUM VITAE

### **Sadegh Karimpouli (PhD)**

*Assistant Professor* in Exploration Geophysics / Rock Physics,  
Mining Engineering Group, Faculty of Engineering,  
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**GoogleScholar:** <https://scholar.google.com/citations?user=hkNpwOAAAAAJ&hl=en>

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## EDUCATION

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- 2009 - 2013  
PhD  
*Amirkabir University of Technology, Iran.*  
*Uppsala University, Sweden.*  
**Thesis topic:** Estimation of carbonate reservoir parameters using Bayesian methods and role of structural controls on facies distribution.  
In collaboration with *National Iranian Oil Company (NIOC)*  
**Thesis subject:** Seismic Exploration- Rock Physics
- 2007 – 2009  
MSc.  
*Isfahan University of Technology, Iran.*  
**Thesis topic:** Predicting petrophysical parameters of a petroleum reservoir using multivariate statistical and geostatistical methods.  
In collaboration with *National Iranian South Oil Company (NISCO)*  
**Thesis subject:** Reservoir modeling- Rock Physics- Geostatistics
- 2003 – 2007  
BSc.  
*Sahand University of Technology, Iran.*  
**Major:** Mineral Exploration

## ACADEMIC EMPLOYMENT

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- 2019 to present  
2013 to present  
*Manager of Mining Engineering Group, University of Zanjan, Zanjan, Iran.*  
*Assistant Professor, University of Zanjan, Zanjan, Iran.*

## HONORS AND AWARDS

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- Outstanding Reviewer*
- 2018  
International Journal of Heat and Mass Transfer
- 2017  
Journal of Applied Geophysics
- 2015  
Journal of Petroleum Science and Engineering

**Visiting**

- 1/2019 - 2/2019 International Geothermal Centre, Hochschule Bochum, Bochum, Germany.  
9/2012 - 3/2013 Uppsala University, Uppsala, Sweden.  
8/2008 - 10/2008 Clausthal University of Technology, Clausthal-Zellerfeld, Germany.

**PROFESSIONAL AFFILIATIONS AND SERVICES**

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- Organization Member** Society of Exploration Geophysics (SEG)  
ROCKETH (the Rock Physics Network)  
National Iranian Geophysical Society (NIGS)  
Iranian Petroleum Geomechanics Association (IPGA)
- Reviewer of** Journal of Petroleum Science and Engineering  
Journal of Applied Geophysics  
Journal of Geophysics and Engineering Interpretation  
International Journal of Heat and Mass Transfer  
Acta Geophysica and many others.

**PUBLICATIONS**

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-----**PEER-REVIEWED JOURNAL ARTICLES**-----

- [23] **Karimpouli, S.**, Faraji, A., Balcewicz, M. and Saenger E., **2020**, Computing Heterogeneous Core Sample Velocity Using Digital Rock Physics: A Multiscale Approach. *Computers and Geosciences*, 135, 104374.
- [22] **Karimpouli, S.**, Tahmasebi, P., and Saenger E. H., **2019**, Coal Cleat/Fracture Segmentation Using Convolutional Neural Networks, *Natural Resources Research*, (Accepted), <https://doi.org/10.1007/s11053-019-09536-y>.
- [21] Rezanezhad M., Lajevardi S. A., and **Karimpouli S.**, **2019**, Effects of pore-crack relative location on crack propagation in porous media using XFEM method, *Theoretical and Applied Fracture Mechanics*, 103, 102241.
- [20] **Karimpouli S.** and Tahmesbi P., **2019**, Segmentation of digital rock images using deep convolutional autoencoder networks, *Computers & Geosciences*, 126, 142-150.
- [19] **Karimpouli S.** and Tahmasebi P., **2019**, Image-based velocity estimation of rock using Convolutional Neural Networks, *Neural Networks*, 111, 89-97.
- [18] **Karimpouli, S.**, and Tahmasebi, P., **2019**. 3D Multifractal Analysis of Porous Media Using 3D Digital Images, *Geophysical Prospecting*, 67, 1082-1093.
- [17] **Karimpouli, S.**, Tahmasebi, P., and Saenger E. H., **2018**. Estimating 3D elastic moduli of rock from 2D thin section images using Differential Effective Medium Theory. *Geophysics*, 83, 211-219.
- [16] **Karimpouli, S.**, Khoshlesan, S., Saenger, E. H. and Koochi, H. H., **2018**. Application of alternative digital rock physics methods in a real case study: a challenge between clean and cemented samples. *Geophysical Prospecting*, 66(4), 767-783.

- [15] **Karimpouli, S.**, and Fattahi, H., **2018**. Estimation of P-and S-wave impedances using Bayesian inversion and adaptive neuro-fuzzy inference system from a carbonate reservoir in Iran. *Neural Computing and Applications*, 29, 1059-1072.
- [14] **Karimpouli, S.**, Tahmasebi, P., Ramandi, H.L., Mostaghimi, P. and Saadatfar, M., **2017**. Stochastic modeling of coal fracture network by direct use of micro-computed tomography images. *International Journal of Coal Geology*, 179,153-163.
- [13] Ghaffari, S. N., and **Karimpouli, S.**, **2017**. Improved relations for permeability-porosity trends using digital rock physic, *Journal of Petroleum Geomechanics*, 1, 41- 52 (In Persian).
- [12] **Karimpouli, S.**, and Tahmasebi, P., **2016**. A Hierarchical Sampling for Capturing Permeability Trend in Rock Physics. *Transport in Porous Media*, 116, 1057-1072.
- [11] **Karimpouli, S.**, and Tahmasebi, P., **2016**. Conditional reconstruction: An alternative strategy in digital rock physics. *Geophysics*, 81(4), D465-D477.
- [10] Fattahi, H. and **Karimpouli, S.**, **2016**. Prediction of porosity and water saturation using pre-stack seismic attributes: a comparison of Bayesian inversion and computational intelligence methods. *Computational Geosciences*, 20(5), 1075–1094.
- [9] **Karimpouli, S.**, Salimi, A. and Ghasemzadeh, S., **2016**. Semionlinear spectral unmixing using a neural network-based forward modeling. *Journal of Applied Remote Sensing*, 10(3), 036006.
- [8] Shokri, B., Doulati F., and **Karimpouli, S.**, **2016**, Prediction of remained pyrite fraction within a coal waste pile with using of multivariate regression method. *Journal of Environmental Science and Technology*, 18(3), 37-52 (In Persian).
- [7] **Karimpouli, S.**, Abbaszadeh, S., and Amini, E., **2016**, Automatic detection of lineation in satellite images and aerial photos using Radon transform. *Iranian Journal of Mining Engineering*, 10(29), 41-49 (In Persian).
- [6] Salimi A., Ziaii M., Hosseinjani Zadeh M., Amiri A., and **Karimpouli S.**, **2015**, High performance of the support vector machine in classifying hyperspectral data using a limited dataset. *International Journal of Mining and Geo-Engineering*, 49(2) 253-268.
- [5] **Karimpouli, S.**, and Malehmir, A., **2015**. Neuro-Bayesian facies inversion of prestack seismic data from a carbonate reservoir in Iran. *Journal of Petroleum Science and Engineering*, 131, 11-17.
- [4] **Karimpouli, S.**, Malehmir, A., Hassani, H., Khoshdel, H. and Nabi-Bidhendi, M., **2015**. Automated diffraction delineation using an apex-shifted Radon transform. *Journal of Geophysics and Engineering*, 12(2), 199.
- [3] **Karimpouli, S.**, Hassani, H., Malehmir, A., Nabi-Bidhendi, M. and Khoshdel, H., **2013**. Understanding the fracture role on hydrocarbon accumulation and distribution using seismic data: a case study on a carbonate reservoir from Iran. *Journal of Applied Geophysics*, 96, 98-106.
- [2] **Karimpouli, S.**, Hassani, H., Nabi-Bidhendi, M., Khoshdel, H. and Malehmir, A., **2013**. Application of probabilistic facies prediction and estimation of rock physics parameters in a carbonate reservoir from Iran. *Journal of Geophysics and Engineering*, 10(1), 015008.
- [1] **Karimpouli, S.**, Fathianpour, N. and Roohi, J., **2010**. A new approach to improve neural networks' algorithm in permeability prediction of petroleum reservoirs using supervised committee machine neural network (SCMNN). *Journal of Petroleum Science and Engineering*, 73(3), 227-232.

-----*MANUSCRIPTS SUBMITTED FOR REVIEW - IN PREPARATION*-----

- [4] **Karimpouli, S.**, and Tahmasebi, P. and Ramandi H., A Review of Experimental and Numerical Modeling of Digital Coalbed Methane: Imaging, Segmentation, Fracture Modeling, and Permeability Prediction, *Earth-Science Reviews* (Under review).
- [3] Rezanezhad M., Lajevardi S.A., and **Karimpouli S.**, Effects of pore(s)-crack locations and arrangements on crack growth modeling in porous media, *Theoretical and Applied Fracture Mechanics* (Under review).

- [2] Karimpouli, S., and Saenger, E., Machine learning based prediction of pore space characteristics of rock via signals from ultrasonic lab test: A numerical approach (Under preparation)
- [1] Tahmasebi, P., and **Karimpouli, S.**, Improving Geostatistical Facies Modeling Using an Adaptive and Multiscale Approach, *Stochastic Environmental Research and Risk Assessment* (Under Review).

-----CONFERENCE PRESENTATIONS-----

- [28] Khodaei, P. and **Karimpouli, S.**, An investigation on measurement methods of physical and mechanical properties of rock from drilling cutting, *2<sup>nd</sup> Iranian conference of green mining and mine industry*, 2019, Zanjan, Iran.
- [27] **Karimpouli, S.**, Segmentation of digital rocks using deep learning, *4<sup>th</sup> Seminar of Petroleum Geophysical Exploration*, 2019, Tehran, Iran.
- [26] **Karimpouli, S.**, Estimation of 3D elastic parameters from 2D images, *8<sup>th</sup> Minisymposium on Poroelasticity*, 2019, Bochum, Germany.
- [25] **Karimpouli, S.**, Deep Learning methods in digital rock physics: segmentation and parameter estimation, *8<sup>th</sup> Minisymposium on Poroelasticity*, 2019, Bochum, Germany.
- [24] **Karimpouli, S.**, Digital Rocks: A review on capabilities of a new technology in computing hydrocarbon reservoir characteristics, *4<sup>th</sup> Symposium of sedimentological society of Iran*, 2018, Zanjan, Iran.
- [23] Rezanezhad M., **Karimpouli S.**, and Lajevardi S.A., Numerical modeling of crack propagation in sandstone reservoirs, *4<sup>th</sup> Symposium of sedimentological society of Iran*, 2018, Zanjan, Iran.
- [22] Khoshaein E. and **Karimpouli S.**, Grains packing effects on wave velocity in sandstone type hydrocarbon reservoirs, *4<sup>th</sup> Symposium of sedimentological society of Iran*, 2018, Zanjan, Iran.
- [21] **Karimpouli, S.**, Tahmasebi, P., and Saenger E.H., A method for estimating 3D elastic moduli of rock using 2D images, *18<sup>th</sup> Iranian Geophysical Conference*, 2018, Tehran, Iran.
- [20] Faraji, A., and **Karimpouli, S.**, A multiscale approach to estimate effective elastic moduli using digital rock images, *18<sup>th</sup> Iranian Geophysical Conference*, 2018, Tehran, Iran.
- [19] Mohammadi M., **Karimpouli S.**, Masoumi Z., and Ghods A., Site effect characterization of Zanjan city using surface waves, *18<sup>th</sup> Iranian Geophysical Conference*, 2018, Tehran, Iran.
- [18] Alavian S.M., Sonei An., and **Karimpouli, S.**, Structural interpretation of South-Pars gas reservoir using seismic attributes, *1<sup>st</sup> National Conference of Modeling in Mining Engineering*, 2018, Qazvin, Iran.
- [17] Rezanejad M., **Karimpouli S.**, and Lajevardi S.A., Numerical modeling of crack growth in porous media using XFEM, *1<sup>st</sup> National Conference of Modeling in Mining Engineering*, 2018, Qazvin, Iran.
- [16] **Karimpouli, S.**, and Tahmasebi, P., Pore space heterogeneity evaluation of 3D digital rock samples using multifractals, *2<sup>nd</sup> National Conference on Petroleum Geomechanics*, 2017, Tehran, Iran.
- [15] Khoshlesan, S., and **Karimpouli, S.**, Two-step computing of effective elastic parameters of rock to preserve microstructures effect using digital rock physics, *2<sup>nd</sup> National Conference on Petroleum Geomechanics*, 2017, Tehran, Iran.
- [14] Samiei, S., and **Karimpouli, S.**, Effects of pore type and size on elastic parameters of rock using digital rock modeling, *2<sup>nd</sup> National Conference on Petroleum Geomechanics*, 2017, Tehran, Iran.
- [13] Ghasemzadeh, S., **Karimpouli, S.**, and Salimi, A., Hydrothermal alteration mapping using ASTER images to determine the potential of mineralization in Jebal-Barez area, *8<sup>th</sup> Iranian Conference of Economic Geology*, 2016, Zanjan, Iran.
- [12] Nazari, S., Arabamiri, A. R., Kamkar, A., and **Karimpouli, S.**, Cu exploration using resistivity and induced polarization methods in Chahar-Gonbad, Kerman, *8<sup>th</sup> Iranian Conference of Economic Geology*, 2016, Zanjan, Iran.
- [11] Daviran, M., **Karimpouli, S.**, and Kazemi, M., Geochemical anomaly separation from background using fractal method; Sungun porphyry copper deposit, *8<sup>th</sup> Iranian Conference of Economic Geology*, 2016, Zanjan, Iran.

- [10] **Karimpouli, S.**, Khoshlesan, S., and Tahmasebi, P., Prediction of seismic wave velocity of 3D samples using 2D images: A comparison between simulation based and analytical method, *17<sup>th</sup> Iranian Geophysical Conference*, 2016, Tehran, Iran.
- [9] Salimi A., Ziaii M., Hosseinjani Zadeh M., Amiri A., and **Karimpouli, S.**, Classification of hydrothermal alteration zones using a Hyperion data and support vector machine, *34<sup>th</sup> National and 2<sup>nd</sup> International Geoscience Congress*, 2016, Tehran, Iran.
- [8] **Karimpouli, S.**, and Jodeiri, B., Comparison of analytical and neural network committee machines to estimate water flow into underground structures: A case study from Amirkabir Tunnel, *1<sup>st</sup> National Conference on Soft Computing*, 2015, Roudsar, Iran.
- [7] **Karimpouli, S.**, and Tahmasebi, P., An alternative method in digital rock physics using 2d to 3d image reconstruction, *1<sup>st</sup> National Conference on Petroleum Geomechanics*, 2015, Tehran, Iran.
- [6] **Karimpouli, S.**, and Tahmasebi, P., 2D to 3D reconstruction: An alternative method in digital rock physic, *2<sup>nd</sup> Seminar of Petroleum Geophysical Exploration*, 2015, Tehran, Iran.
- [5] Jalili, S., **Karimpouli, S.**, Sattari, A., and Mohamadlipour, Z., Combination of 2D inversion and 3D modeling of Geo-electric data in Khalifelo copper exploration limits Khoramdare –Zanjan, *33<sup>rd</sup> National Geosciences Conference*, 2015, Tehran, Iran.
- [4] Nazari, S., **Karimpouli, S.**, and Ahmadi, R., Effect of correlation of variables in S-wave velocity prediction using regression and neural networks method, *5<sup>th</sup> Iranian Mining Engineering Conference*, 2014, Tehran, Iran.
- [3] Karimpouli, S., Hassani, H., Nabi-Bidhendi, M., Khoshdel, H. and Malehmir, A., Modeling of reservoir fractures using scattered waves and diffraction. *16<sup>th</sup> Iranian Geophysical Conference*, 2014, Tehran, Iran.
- [2] **Karimpouli, S.**, Hassani, H., Nabi-Bidhendi, M., Khoshdel, H. and Malehmir, A., Modeling of facies distribution in carbonate reservoirs using Bayesian inversion. *1<sup>st</sup> Seminar of Petroleum Geophysical Exploration*, 2013, Tehran, Iran.
- [1] **Karimpouli, S.**, Fathianpour, N., A new regression model for permeability prediction in a hydrocarbon reservoir from SW of Iran using multivariate statistical method. *1<sup>st</sup> National Conference of Oil and Gas Exploration*, 2009, Ahvaz, Iran.

#### -----BOOKS-----

- [2] **Karimpouli, S.**, 2016, *Technical English for Students of Mining Engineering*. University of Zanjan Publishing, P. 250.
- [1] **Karimpouli, S.**, Hassani, H., Khoshdel, H., Malehmir, A., and Nabi-Bidhendi, M., 2015, *Detection of High Quality Parts of Hydrocarbon Reservoirs Using Bayesian Facies Estimation: A Case Study on a Carbonate Reservoir from Iran*, in *Advances in Data, Methods, Models and Their Applications in Oil/Gas Exploration*. **Book Chapter**, Science Publishing Group. ISBN: 978-1-940366-20-3.

#### TEACHING AND SUPERVISING

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- Global Geophysics
- Exploration Geophysics
- Rock physics
- Structural Geology
- Petroleum Geology
- Well Logging

- Supervised MSc. projects:

S. Khoshlesan (*In collaboration with NISCO- 2017*), P. Roshanaei (*In collaboration with NISCO- 2017*), and M. Rezanejad (2018), Faraji A. (2019), Golabi (2019).

- Supervisor of ongoing MSc. projects: Khodaei, P., and M. Besharati.
- Supervisor of more than 50 BSc. Projects.

## SOFTWARE SKILLS

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### - Programming:

Well versed in problem solving and algorithms especially with MATLAB. Also familiar with scripting machine learning algorithms in PYTHON.

### - Commercial software:

Familiar with AVIZO, Hampson-Russel, VISTA, RockWorks and ArcGIS.

## RESEARCH INTERESTS

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### - Digital Rock Physics:

2D to 3D characterization of digital rocks, Simulation of porous media, Multiscale digital rock physics, Mechanical behavior of porous media, Pore network modeling, Flow in porous media, Crack growth in rocks.

### - Exploration Geophysics:

Petrophysics, Well to seismic inversion and interpretation, Geostatistics, Mineral exploration methods (seismic and geoelectrical exploration).

### - Artificial Intelligent methods in geosciences:

Applications of Neural Networks (NN), Deep Learning (DL) and Convolutional Neural Networks (CNN) in rock physics.

## REFERENCE PEOPLE

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### **Prof. Alireza Malehmir**

Department of Earth Science, Uppsala University, Sweden.

*Principal coordinator of H2020 RIA Smart Exploration, EU.*

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### **Dr. Reza Saberi**

CGG Services, The Hague, Netherland.

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### **Dr. Pejman Tahmasebi**

Department of Petroleum Engineering, University of Wyoming, USA.

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### **Prof. Erik H. Saenger**

International Geothermal Centre, Bochum University of Applied Sciences, Bochum, Germany.

Ruhr-University Bochum, Bochum, Germany.

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