

DR. MOHAMMAD HADI MEHRANPOUR

Geomechanics Researcher

@ mh.mehranpour@gmail.com

+31 (0)6 55985817

Utrecht, Netherlands

mhmehranpour.com

linkedin.com/in/mehranpour

WORK EXPERIENCE

PostDoctoral Researcher

Utrecht University | sponsored by NAM (2018-20) and NWO (DeepNL)

February 2018 – February 2022

Utrecht, the Netherlands

- Key scientist for Digital Rock Modeling using Discrete Element Method (DEM)
- Investigate fluid production impact on subsidence and induced seismicity
- Developed innovative numerical models to upscale lab data to the field-scale
- Developed advanced reservoir compaction models based on microscale processes
- Designed state of the art experiments featuring Real-Time X-ray CT-imaging
- Introduced a cutting-edge approach for Image Analysis and Digital Rock Modeling
- Mentoring four PhD and Master students

Research Fellow

The University of Arizona | sponsored by NIOSH

August 2014 – December 2017

Tucson, USA

- Experimental and numerical study of fractured rock under real field conditions
- Performed laboratory geomechanical and geophysical tests on rock samples
- Rock fracture network analyzing with advanced mathematical algorithms
- Developed novel fractured rock failure criteria for wellbore stability analysis
- Developed an innovative Digital Rock Modeling platform for fractured rock

Research Engineer

The University of Tehran

September 2010 – August 2014

Tehran, Iran

- Manager to Design and develop apparatuses for geomechanical testing
- Designed and programmed laser scanner for rock surface
- Studied time-dependent behavior of rock salt, mudrock and shale
- Proposed an advanced mathematical method to quantify rock roughness
- Experimental and numerical study on fracture growth in rock
- Supervised four undergraduate students

EDUCATION

The University of Arizona

PhD. in Geological, Geophysical and Mining Engineering

August 2014 – August 2017

Tucson, USA

- Thesis summary: New failure criteria were developed for fractured rock considering the real field stress condition (polyaxial confining stresses). The new criteria can be used for different applications in geomechanics like wellbore stability analysis. These criteria also have the capability of capturing the anisotropic and scale dependent behavior of fractured rocks.

The University of Tehran

M.Sc. in Rock Mechanics-Mining Engineering

September 2009 – September 2012

Tehran, Iran

- Thesis summary: A new method was developed to quantify rock fracture roughness. With the new roughness parameters, the mechanical behavior of fractures was investigated under the real field conditions. These parameters can also be used to study the hydraulic behavior of rock fractures.

COMPUTER SKILLS

- OBJECT-ORIENTED PROGRAMMING

Python

MATLAB

- DISCRETE ELEMENT METHOD (DEM)

PFC

3DEC

UDEC

- FINITE ELEMENT METHOD (FEM)

ANSYS

COMSOL Multiphysics

- IMAGE ANALYSIS

Avizo

- OTHER ENGINEERING SOFTWARES

FLAC

Rockscience Suite

AutoCad

SOFT SKILLS

Learning Potential

Team Work

Problem-Solving

Responsibility

Flexibility

Work Under Pressure

Professionalism

Competitive

Loyalty

Commitment

SCIENTIFIC SKILLS

Numerical Modeling

Big Data Management

Data Analysis and Visualization

CERTIFICATES

Comprehensive Management: Planning and Engineering

The University of Tehran

Summer 2008

Tehran, Iran

140 hours

PFC suit training course

Itasca

November 2018

Ecully, France

24 hours

LANGUAGES

- English (Full professional proficiency)
- Persian (Native speaker)

The University of Tehran

B.Sc. in Mining Engineering-exploitation

📅 September 2004 – September 2009 📍 Tehran, Iran

- Thesis summary: The time dependent behavior of sedimentary rocks was investigated by employing a new technique of indentation test.

PUBLICATIONS AND TALKS

Journals

- Four published peer reviewed papers
- Three peer reviewed papers on DEM in preparation
- Eight papers published in conference proceedings
- Mehranpour, M.H., Hangx, S.J.T., Spiers, C.J. (under-review) A new contact model describing elastic and inelastic grain-scale interactions in deforming Groningen reservoir sandstone using Discrete Element Method: Comparison with laboratory and field data (JGR Solid Earth, IF=3.64)
- Mehranpour, M.H., Kulatilake, P.H.S.W., Xingen, M., He, M. (2018). Development of New Three-Dimensional Rock Mass Strength Criteria. *Rock Mechanics and Rock Engineering*. 51(11),3537-3561 (IF=4.14)
- Mehranpour, M.H., Kulatilake, P.H.S.W. (2017). Improvements for the Smooth Joint Contact Model of the Particle Flow Code and its applications. *Computers and Geotechnics*. 87,163-177 (IF=3.82)
- Mehranpour, M.H., Kulatilake, P.H.S.W. (2016). Comparison of six major intact rock failure criteria using a particle flow approach under true-triaxial stress condition. *Journal of Geomechanics and Geophysics for Geo-Energy and Geo-Resources*. 2(4), 203-229 (IF=2.22)

Invited talks and presentations

- December 2020, Utrecht, the Netherlands, Earth Structures and Simulations talk: From micro to macro: Discrete element modelling of Groningen gas reservoir compaction
- July 2019, Cairns, Australia, International Conference on Tomography of Materials Structures: Measuring intergranular force in granular media from time-lapse micro CT-imaging
- June 2017, San Francisco, USA, US Rock Mechanics/Geomechanics Symposium: Modifications for the Smooth Joint Contact Model in the Particle Flow Code
- June 2016, Houston, USA, US Rock Mechanics/Geomechanics Symposium: Introduction of new roughness parameters to quantify rock joints surface using Fourier analysis

FIELD EXPERIENCE

Intern

Eastern Alborz Coal Mines Co., Tazare Coal Mine

📅 Summer 2008 (240 hours) 📍 Semnan, Iran

Intern

Iran Water and Power Resources Co., Azad Dam

📅 Summer 2007 (240 hours) 📍 Kurdistan, Iran

EXTRACURRICULAR

- Organizing charities for earthquake-stricken people of Azerbaijan, Iran
- Organizing annual graduation celebration for Mining Engineering department of the University of Tehran
- Organizing several scientific field tours and lectures for mining engineering students

MOST PROUD OF

- The top student at Bachelor and Master degrees
- In top 5% at Quantitative Reasoning GRE exam (168/170)
- In top 1% at National university entrance exam

COURSE WORK

- Finite Element Method
- Fracture Mechanics
- Unconventional Reservoir Geomechanics
- Reservoir Geomechanics
- Exploration Seismology
- Seismic Data Processing
- Instrumentation and Monitoring
- Project Control and Management

SCHOLARSHIPS

- The National Institute for Occupational Safety and Health
- The Women's Auxiliary to the American Institute of Mining, Metallurgical and Petroleum Engineers
- Society for Mining, Metallurgy and Exploration Tucson

REFERENCES

Prof. dr. Chris Spiers

@ Utrecht University-High Pressure and Temperature Laboratory

✉ c.j.spiers@uu.nl

Postdoc supervisor (NAM project)

Dr. Suzanne Hangx

@ Utrecht University-High Pressure and Temperature Laboratory

✉ s.j.t.hangx@uu.nl

Postdoc supervisor (DeepNL project)

Prof. dr. Pinnaduwa Kulatilake

@ The University of Arizona-Rock Mass Modeling and Computational Rock Mechanics Laboratories

✉ kulatila@u.arizona.edu

Ph.D. supervisor (NIOSH project)