JASSEM ABBASI

University of Stavanger (UiS), 4036 Stavanger, Norway

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CLICK HERE FOR MORE INFO

ABOUT ME

A researcher with experience in working close with university and industry, professional in numerical analysis of physical processes, especially flow in porous media and three years of research in the field of Scientific Machine Learning, and Deep Learning.

QUALIFICATIONS

Programming
Reservoir Engineering/Simulation
Scientific Machine Learning / Deep Learning
Computational Fluid Dynamics (CFD)
Numerical/Analytical Simulation
Flow in Porous Media | Thermodynamics
Data Analytics
Cloud/GPU Computing

SKILLS

ECLIPSE, CMG, MRST (...)
COMSOL, OpenFoam
Petrel
PVTi, PVTsim (...)
PipeSim (...)

Python, C#, MATLAB
TensorFlow, PyTorch
Sklearn, SciPy, (...)
PyTorch Geometric
Git (Version Control)
Azure ML
Databases (MySQL)
GPU Computing
OOP (Object Oriented Programming)
PowerBI

WP Web Development
Adobe Photoshop
Digital Marketing

LANGUAGES

English Fluent
Norwegian Elementary
Persian Native

CURRENT ACTIVITY

Application of Physics-Informed Neural Networks in Core-Scale Simulation of Flow in Porous Media

We are focused on the Physics-Informed Neural Networks based analysis (forward and inverse) of flow in porous media at core scale processes, in specific 3D simulation of two-phase flow (CO_2 flooding) in multi-scale fractured cores.

EXPERIENCES (selected)

EQUINOR ASA, Norway (2022)
Subsurface Geoscience/Reservoir Simulation Engineer (Summer Intern)

ZODAN SOLUTIONS LTD., UK (2019-2020)
Scientific Software Developer

SHIRAZ UNIVERSITY/PETROAZMA OIL COMPANY, Iran (2016-2018)
Reservoir [Simulation] Engineer/Researcher

PETROTIRAZIS OIL COMPANY PTED., Iran (2016)
Scientific Software Developer (Intern)

EDUCATION

ETH Zürich (Summer 2024)
ETH AI Center – Visiting Researcher

UNIVERSITY OF STAVANGER (2021- Sep. 2024)
Petroleum Technology – Scientific Machine Learning (PhD)

SHIRAZ UNIVERSITY (2014-2016)
Reservoir Engineering (M.Sc.)

PETROLEUM UNIVERSITY OF TECHNOLOGY (2010-2014)
Reservoir Engineering (B.Sc.)

PUBLICATIONS (selected)

Ongoing**:** History Matching of Multi-Scale and Multi-Phase Flow in Fractured Porous Media Using Physics-Informed Neural Networks

SPE Journal (2024): Application of Physics-Informed Neural Networks for Estimation of Saturation Functions from Counter current Spontaneous Imbibition Tests →

Neurocomputing (2024): Physical Activation Functions (PAFs): An Approach for More Efficient Induction of Physics into Physics-Informed Neural Networks (PINNs) →

Energy and Fuels (2023): Simulation and Prediction of Spontaneous Imbibition at Early and Late Times Using Physics-Informed Neural Networks →

Petroleum Science (2021): On the Impact of Solutal Marangoni Convection during Chemical Flooding for Improved Oil Recovery →

Journal of Petroleum Sci. and Eng. (2018): A new numerical approach for investigation of the effects of dynamic capillary pressure in imbibition process →

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EXPERIENCES

UNIVERSITY OF STAVANGER, Norway (2021-2024)

PhD Research Fellow in Petroleum Technology/ Artificial Intelligence

Research on Physics Informed Neural Networks (PINNs) and its application in solving the forward and inverse problems of flow in porous media.

I am planning to embark on a visit to Brown University during the spring 2024, as a participant in a research collaboration involving researchers from the University of Stavanger, Brown University, and Stanford University.

EQUINOR ASA, Norway (2022)

Subsurface Engineer | Reservoir Simulation (intern)

During this two-month internship, I worked on an interesting business/engineering case of related to tying-back of two offshore gas fields while both economical and engineering aspects of the project was needed to be considered. In this project, I could finish the numerical simulation of the investigating case and finally provide statistical business/engineer insights to the management team.

ZODAN SOLUTIONS LTD., UK (2018-2021)

Scientific Software Developer

Developing commercial software for simulation of thermodynamics of subsurface geofluids including oil, gas, and water

SHIRAZ UNIVERSITY/PETROAZMA OIL COMPANY (2016-2018)

Reservoir Simulation Engineer | Research Assistant

Pore to field scale study of EOR methods in several oil fields. Screening of EOR methods, experiment design and evaluation, upscaling, numerical and analytical simulation, geological analysis, pilot design and proposal preparation. Also, research assistant at academic research projects and advisor of several master students.

PETROTIRAZIS OIL COMPANY PTED., Iran (2016)

Software Developer

Development of software related to petroleum industry. The software was used for providing fast-track development plan in the early stages of field development projects.

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HONORS & AWARDS

2024 Awarded a prestigious research commercialization fund (Qualification Project) from Research Council of Norway (~0.5 MNOK)

- Pisces-AI: Physics-Informed AI for Subsurface Characterization Experiments

2024 Awarded as the **Best PhD Candidate** of The Year by **SPE Stavanger**

2024 Chair in two sessions at EAGE Annual Exhibition and Conference in Oslo

- ML & AI for Geological Characterization I
- ML & AI for Geological Characterization III

2023 Awarded an innovation research stipend (Funded by: Validé AS, Stavanger, Norway)

- Development of a new generation of solvers for the interpretation of core-scale experiments

2019 Ranked 3rd in Second Iranian Petro Match (IPM)

- Hackathon: optimization of well-placing in a highly heterogeneous oil field

2018-Present Journal and Conference Reviewer

- Journal of Petroleum Science and Engineering
- Journal of Computational Geosciences
- Journal of Neurocomputing
- Journal of Natural Gas Science and Engineering
- ACS Omega
- Journal of Geophysics and Engineering
- Journal of Molecular Liquids
- Journal of Petrophysics
- EAGE Conferences

2019 3 Years Distinguished Researcher of EOR Research Centre at Shiraz University

2017 Distinguished Researcher of EOR Research Centre at Shiraz University

2017 Winner of Military Service Exemption Award of Iran's National Elites Foundation

2010-2014 Ranked among the 1st 0.5% of participants in the National Entrance Exam for the Universities of Iran

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JOURNAL ARTICLES

Application of Physics-Informed Neural Networks for Estimation of Saturation Functions from Countercurrent Spontaneous Imbibition Tests
SPE Journal (2023) – SPE-218402-PA
Jassem Abbasi, Pål Østebø Andersen

Simulation and Prediction of Counter current Spontaneous Imbibition at Early and Late Times Using Physics-Informed Neural Networks
Energy and Fuels (2023)
Jassem Abbasi, Pål Østebø Andersen

Physical Activation Functions (PAFs): An Approach for More Efficient Induction of Physics into Physics-Informed Neural Networks (PINNs)
Neural-Computing (2024)
Jassem Abbasi, Pål Østebø Andersen

Theoretical Comparison of Two Setups for Capillary Pressure Measurement by Centrifuge
Heliyon
Jassem Abbasi, Pål Østebø Andersen

A Novel Physics based Method for Modelling COVID-19
medRxiv
Harris Sajjad Rabbani, Kofi Osei-Bonsu, Jassem Abbasi, Peter Kwame Osei-Bonsu, Thomas Daniel Seers

A Multiscale Study on the Effects of Dynamic Capillary Pressure in Two-Phase Flow in Porous Media
Korean Journal of Chemical Engineering, 2020
Jassem Abbasi, Mojtaba Ghaedi, Masoud Riazi

On the Impact of Solutal Marangoni Convection during Chemical Flooding for Improved Oil Recovery
Petroleum Science, 2020
Sepideh Palizdan, Jassem Abbasi, Masoud Riazi, Mohammadreza Malayeri

Prediction of multiphase critical choke flow behavior by using a rigorous artificial neural network method
Journal of Flow Measurement and Instrumentation, 2019
Saeed Rashid, Ali Ghamartale, Jassem Abbasi, Hoda Darvish, Afshin Tatar

A new numerical approach for investigation of the effects of dynamic capillary pressure in imbibition process
Journal of Petroleum Science and Engineering, 2018
Jassem Abbasi, Mojtaba Ghaedi, Masoud Riazi

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JOURNAL ARTICLES (cont.)

Improvements in scaling of counter-current imbibition recovery curves using a shape factor including permeability anisotropy
Journal of Geophysics and Engineering, 2018
Jassem Abbasi, Shiva Sarafrazi, Masoud Riazi, Mojtaba Ghaedi

Modified shape factor incorporating gravity effects for scaling counter-current imbibition
Journal of Petroleum Science and Engineering, 2017
Jassem Abbasi, Masoud Riazi, Mojtaba Ghaedi, Abouzar Mirzaei-Paiaman

Discussion on Similarity of Recovery Curves in Scaling of Imbibition Process in Fractured Porous Media
Journal of Natural Gas Science and Engineering, 2016
Jassem Abbasi, Mojtaba Ghaedi, Masoud Riazi

A Simulation investigation of Performance of Polymer Injection in Hydraulically Fractured Heterogeneous Reservoirs
Journal of Petroleum Exploration and Production Technology, 2016
Jassem Abbasi, Babak Raji, Masoud Riazi, Azim Kalantari Asl

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CONFERENCE ARTICLES

Application of Physics-Informed Neural Networks for Estimation of Saturation Functions from Countercurrent Spontaneous Imbibition Tests
EAGE IOR 2023, Netherland
Jassem Abbasi, Pål Østebø Andersen

Simulation and Prediction of Counter-current Spontaneous Imbibition at Early and Late Times Using Physics-Informed Neural Networks
SPE EUROPEC 2023, July, Vienna, Austria
Jassem Abbasi, Pål Østebø Andersen

Improved Initialization of Non-linear Solvers in Numerical Simulation of Flow in Porous Media with a Real-time Deep Learning Approach
SPE EUROPEC 2022, July, Madrid, Spain
Jassem Abbasi, Pål Østebø Andersen

Machine learning Assisted Study on Determination of the Most Relevant Parameters for Prediction of Permeability of Tight Sandstones in Mercury Injection Capillary Pressure Tests
SPWLA (SPE) Stavanger 2022, June, Stavanger, Norway
Jassem Abbasi, Jiuyu Zhao, Sameer Ahmed, Jianchao Cai, Pål Østebø Andersen

Theoretical Comparison of Two Setups for Capillary Pressure Measurement by Centrifuge
EAGE IOR 2021, Online
Jassem Abbasi, Pål Østebø Andersen

Pore Scale Direct Numerical Simulation of Simultaneous Marangoni-driven Convection and Mass Diffusion in a Chemical Flooding Process
82th EAGE Annual Conference & Exhibition 2020, Amsterdam
Jassem Abbasi, Sepideh Palizdan, Masoud Riazi, Mohammadreza Malayeri

Investigation of simultaneous co-current and counter-current spontaneous imbibition in presence of gravity effects
80th EAGE Annual Conference & Exhibition 2018
Jassem Abbasi, Mojtaba Ghaedi, Masoud Riazi, Saeed Rashid

A discussion About the Effect of Considering the Dynamic Capillary Forces on Dissimilarity of Imbibition Recovery Curves
EAGE Saint Petersburg 2018
Jassem Abbasi, Mojtaba Ghaedi, Masoud Riazi

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CERTIFICATES

Machine Learning

By Stanford University (hosted by Coursera)

In Progress

Physics-Informed Neural Networks (PINNs)

By KTH and Brown universities

July 2023 – No Expiration Date

Fundamentals of Scalable Data Science

By **IBM** (hosted by **Coursera**)

June 2020 – No Expiration Date

Fundamentals of Digital Marketing

By Google

July 2020 – No Expiration Date

OpenFOAM & Computational Fluid Dynamics (CFD)

By Shiraz University

April 2019 – No Expiration Date

Reservoir Simulation – ECLIPSE

By Petroleum University of Technology

June 2015 – No Expiration Date

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TEACHING EXPERIENCES

Applied Reservoir Simulation
University of Stavanger / University of Campinas, 2024
Teacher Assistant

Advanced Fluid Phase Equilibrium Calculations (workshop)
Shiraz University, 2018
Lecturer

Advanced MATLAB Programming Language (workshop)
Shiraz University, 2018
Lecturer

Reservoir Fluid Properties
Shiraz University, 2017
Teacher Assistant

Reservoir Simulation
Shiraz University, 2017
Teacher Assistant

ECLIPSE Reservoir Simulation Software
Shiraz University, 2015-2017
Software Instructor

PVTi and PVTsim Fluid Modelling Software
Shiraz University, 2016
Software Instructor

PipeSim Production Engineering Software
Shiraz University, 2016
Software Instructor

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REFERENCES

Pål Østebø Andersen
2020-Present, University of Stavanger
Associate Professor; Pal.andersen@uis.no

Aksel Hiorth
2020-Present, University of Stavanger
Professor; aksel.hiorth@uis.no

Farokh Shoaei
2022, Equinor, Norway
Leader Reservoir Technology; ffk@equinor.com

Siddhartha Mishra
2024, ETH Zurich, Switzerland
Professor in Applied Mathematics [Scientific Machine Learning]; siddhartha.mishra@sam.math.ethz.ch

Zohrab Dastkhan
2018-2020, Zodan Solutions (now: Qatar Petroleum)
Consultant Reservoir Engineer/Software Developer, London/Doha; zdastkhan@gmail.com

Masoud Riazi
2014-2020, Shiraz University (now: Nazarbayev University)
Associate Professor; masoud.riazi@nu.edu.kz