

ASSEM ABBASI

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ABOUT ME

Research Scientist with six years of experience in Scientific Machine Learning, Scientific Software Development, and Reservoir Engineering. Passionate about developing Al-driven solutions for sustainable energy technologies. Eager to explore new fields and driven by an unwavering enthusiasm for science and innovation.

OUALIFICATIONS

Programming

Scientific Software Development

Machine Learning | Deep Learning

Optimization | Inverse Calculations

Applied Mathematics | Statistics

Data Science | Data Analytics

Reservoir Engineering/Simulation

Computational Fluid Dynamics (CFD)

Flow in Porous Media | Thermodynamics

SKILLS

ECLIPSE, CMG, MRST (...)

COMSOL, OpenFoam

Petrel

PVTi, PVTsim (...)

Optimization (History-matching)



Python, C#, MATLAB, (...)

TensorFlow, PyTorch, JAX Sklearn, SciPy, (...)

Visualization (Matplotlib, ...)

Git (Version Control)

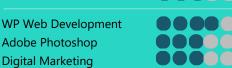
Azure ML

Databases (MySQL)

GPU Computing

OOP (Object Oriented Programming)

PowerBI



LANGUAGES

English Norwegian

CURRENT ACTIVITY

Application of Physics-informed Machine Learning for Modelling of Multiphase Flow Processes in Porous Media

> 3D simulation of two-phase flow (CO₂ flooding) in multiscale fractured shale rocks.

See: https://arxiv.org/abs/2410.20801

EXPERIENCES (selected)

ETH Zürich (2024)

ETH Al Center – Visiting Researcher (Python, PyTorch, SciML, ...)

EQUINOR ASA, Norway (2022) - (Intern)

Geoscience/Reservoir Simulation Engineer (ECLIPSE, Numerical Simulation, Ensemble Analysis, ...)

ZODAN SOLUTIONS LTD., UK (2019-2020)

Scientific Software Developer (C#, Thermodynamics, Software Development, ...)

SHIRAZ UNIVERSITY/PETROAZMA (2016-2018)

Reservoir [Simulation] Engineer/Researcher (ECLIPSE, MRST, Python, Petrel, ...)

PETROTIRAZIS PTED. (2016) - (Intern)

Scientific Software Developer (MATLAB, Software Development, Field Development, Economics, ...)

FDUCATION

UNIVERSITY OF STAVANGER (2021- Dec. 2024)

Scientific Machine Learning (PhD)

SHIRAZ UNIVERSITY (2014-2016)

Reservoir Engineering (M.Sc.)

PETROLEUM UNIVERSITY OF TECHNOLOGY (2010-2014)

Reservoir Engineering (B.Sc.)

HONORS & AWARDS (selected)

2024 Awarded a prestigious research commercialization fund from RCN (~0.5 MNOK) for research on scientific machine learning (SciML).

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

2023 Awarded an innovation research stipend (PLOGEN, 100K NOK)

2020 Ranked 2nd in a national Hackathon: Optimized well-placing in a highly heterogeneous oil field

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

2017 Distinguished Researcher of EOR Research Centre at Shiraz University

PUBLICATIONS (selected)

Under Review (2025): Can Physics-Informed Neural Networks Effectively Model Shock Fronts in Multiphase Flow in Porous Media? A Methodology Review

ML4PS @ NeurIPS (2024): History-Matching of Imbibition Flow in Multiscale Fractured Porous Media Using Physics-Informed Neural Networks (PINNs) →

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 →



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EXPERIENCES

ETH Zürich, Switzerland (2024)

ETH AI Center – Visiting Researcher

Collaborating with the host researchers regarding the challenges in modelling the flow problems with shock front discontinuities.

University of Stavanger, Norway (2021-2024)

PhD Research Fellow in Petroleum Technology/ Artificial Intelligence

Research Physics-Informed Neural Networks (PINNs) and their application in solving forward and inverse problems related to flow in porous media. Also, developing technology for more efficient usage of multi-fidelity datasets using PINNs.

Equinor ASA, Norway (2022)

Subsurface Engineer | Reservoir Simulation (intern)

Worked on a business and engineering case involving the tie-back of two offshore gas fields, addressing both economic and technical aspects.

> I successfully completed the numerical simulations for the project and delivered statistical (ensemble-based) engineering and financial insights to the management team to support decisionmaking.

ZODAN Solutions LTD., UK (2019-2020)

Scientific Software Developer

Developed commercial software for simulating the thermodynamics of subsurface geofluids, including oil, gas, and brine (in C#).

Shiraz University/PetroAzma (2016-2018)

Reservoir Simulation Engineer | Research Assistant

- > Conducted core-to-field scale studies of improved recovery methods across multiple oil/gas fields, including screening techniques, experiment design and evaluation, parameter extraction, upscaling, and geological analysis (ECLIPSE, CMG).
- > Responsibilities included geological analysis, field-scale historymatching, development evaluation, pilot design, proposal preparation (ECLIPSE, CMG, Petrel).
- > Performed PVT study of a gas condensate field.
- > High fidelity analysis of water flow around production wells in naturally fractured reservoirs.
- > Serving as a research assistant on academic projects, while advising several master's students.

PetroTirazis PTED. (2016)

Software Developer (intern)

Developed software tailored to the petroleum industry, designed to support fast-track planning during the early stages of field development projects.

CERTIFICATES (selected)

Machine Learning

Stanford University - 2020

Scientific Machine Learning

By KTH and Brown universities - 2023

Fundamentals of Scalable Data Science

Bv IBM, 2020

Fundamentals of Digital Marketing

Google, 2021

PRESENTATIONS (selected)

2024 ML4PS Workshop at NeurIPS

2024 InterPore Norway Branch

2024 Energy Norway

2024 EAGE IOR+

2022 SPE SPWLA

2022 EAGE EUROPEC

TEACHING (selected)

Scientific Machine Learning (workshop)

University of Campinas, 2024 - Lecturer

Advanced Fluid Phase Calculations (workshop)

Shiraz University, 2019 - Lecturer

Advanced MATLAB Programming (workshop)

Shiraz University, 2018 - Lecturer

ECLIPSE Reservoir Simulation Software

Shiraz University, 2015-2017 - Lecturer

PVTi and PVTsim Fluid Modelling Software

Shiraz University, 2016 – Lecturer

VOLUNTEER (selected)

2024 Session Chair at EAGE Annual Conference in Oslo (ML & AI)

2022 Organizer at Pint of Science Norway

2018-Present Journal and Conference Reviewer

2012-2014 Editor in Chief at a student scientific journal

2011-2012 A member of student scientific association

committee during my B.Sc.

REFERENCES

Pål Østebø Andersen

Supervisor, University of Stavanger | pal.andersen@uis.no

Siddhartha Mishra

Supervisor, ETH Zurich | siddhartha.mishra@sam.math.ethz.ch

Farokh Shoaei

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