# JASSEM ABBASI

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## ABOUT ME

A Research Scientist with +5 years of expertise in Scientific Machine Learning, Physics-Informed ML, Data Analytics, Mathematical Modeling, and Software Development. Passionate about innovation, I develop AI-driven solutions for complex scientific and engineering problems.

## QUALIFICATIONS

Programming
Scientific Software Development
Machine Learning | Deep Learning
Probability and Statistics
Optimization | Inverse Calculations
Applied Mathematics | Linear Algebra
Visualization | Post-Processing
Data Science | Data Analytics
Numerical Simulation

## SOFT SKILLS

Collaborative/Teamwork Mindset
Problem-Solving
Attention to Detail
Continuous Learning
Analytical/Innovative Thinking
Critical Thinking

## TECH. SKILLS

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

## LANGUAGES

English
Norwegian

## RECENT ACTIVITIES

- Application of Physics-informed Machine Learning for Modelling of Multiphase Flow Processes in Porous Media [see: https://arxiv.org/abs/2410.20801]
- A Two-Days Workshop on Scientific Machine Learning [see: SciML]

## EXPERIENCES (selected)

ETH Zürich (2024)
ETH AI Center – Visiting Researcher (Python, PyTorch, SciML, OOP, ...)

EQUINOR ASA, Norway (2022) - (Intern)
Geoscience/Reservoir Simulation Engineer (Numerical Simulation, Ensemble Analysis, Economical Evaluation, ...)

ZODAN SOLUTIONS LTD., UK (2019-2020)
Scientific Software Developer (C#, OOP, Thermodynamics, Software Development, ...)

SHIRAZ UNIVERSITY/PETROAZMA (2016-2018)
Reservoir [Simulation] Engineer (Numerical Simulation, Python, Scientific Computing, ...)

PETROTIRAZIS PTED. (2016-2017) - (Intern)
Scientific Software Developer (MATLAB, UI/UX, Scientific Software Development, Economics, ...)

## EDUCATION

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)
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 Distinguished Researcher (3-years overall) 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 Accurately Model Shock Fronts? A Review and Benchmark

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) →

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## EXPERIENCES (extended)

### ETH Zürich, Switzerland (2024)
**ETH AI Center – Visiting Researcher**

Collaborating with the host researchers regarding the reviewing and benchmarking techniques in solving a mathematical problem (shock fronts) using Physics-Informed ML [achieved +5x speed up, and +7x accuracy in inverse computations], [paper was accepted in ML4PS workshop, during NeurIPS-2024].

### University of Stavanger, Norway (2021-2024)
**PhD Research Fellow in Scientific Machine Learning**

Research on Physics-Informed Neural Networks (PINNs) and their application in solving forward and inverse problems related to flow in porous media [achieved more accuracy and +3x speed up in computations] [acquired external research commercialization fundings (~0.6MNOK)].

Developed Machine Learning Modules for data wrangling, feature selection, outlier detection, and prediction of rock properties [+9x prediction accuracy].

### 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 completed the numerical simulations and delivered statistical (ensemble-based) engineering and financial insights to the management team to support decision-making [delivered an industry-standard report which was used in management negotiations].

### 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#) [developed a commercial thermodynamics software tool that matched the accuracy of existing industry-standard tools while offering additional modules and enhanced functionality].

### Shiraz University/PetroAzma (2016-2018)
**Reservoir Simulation Engineer | Research Assistant**

> Conducted core-to-field scale studies of improved recovery methods across multiple hydrocarbon fields (Finite-Difference). Responsibilities included geological analysis, field-scale history-matching, pilot design, and proposal preparation [the results were directly applied for management decision making processes, and field development projects]. Also, served as a research assistant on academic projects, while advising several master's students. [ranked 2nd in a national hackathon, optimization of field development plan, using a high-fidelity simulator, and several optimization techniques].

### PetroTirazis PTED. (2016-2017)
**Software Developer (intern)**

Developed software tailored to the petroleum industry, designed to support fast-track planning during the early stages of field development projects (MATLAB, OOP, Software Development) [delivered an industry-reliable tool which was the company could use it in their later industrial projects].

## CERTIFICATES (selected)

MLOps-Deployment of Machine Learning Models
Udemy - 2024

Financial Markets
Yale University (Prof. Robert Shiller) - 2024

Scientific Machine Learning
By KTH and Brown universities (Prof. George Karniadakis) - 2023

Machine Learning
Stanford University (Prof. Andrew Ng) - 2021

Fundamentals of Scalable Data Science
By IBM, 2020

## PRESENTATIONS (selected)

2024 ML4PS Workshop at NeurIPS
2024 InterPore Norway Branch
2024 Energy Norway
2023 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

## 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
2013-2014 Editor in Chief at a student scientific journal
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
Manager, Equinor | ffk@equinor.com

Ameya D. Jagtap
Supervisor, Worcester PTech. Inst. (WPI), USA | ajagtap@wpi.edu