

Ali Qaseminejad Raeini

📍 London, UK | ✉ a.q.raeini@gmail.com | 📞 +447742490270
<https://raeini.com/cv/ali-raeini> 📁

PROFESSIONAL EXPERIENCE

Freelance

London, UK

Fullstack development, raeini.com:

Feb 2025 – Now

- **Frontend:** Typescript, Webassembly and Node modules such as AstroJS, React/SolidJS, Sveltia CMS and Google Firebase
- **Backend:** Pingora for reverse-proxy and OAuth, Boost-Beast web-sockets for C++ integration, FastAPI for database and machine learning integration
- **Deployment:** Bash, Firebase CLI, Docker-compose or Terraform

Pareto.AI

Sep 2025 – Now

- Physics and Engineering expert in training large language models (LLMs)

Quaisr

London, UK

Software Developer,

Aug 2024 – Jan 2025

- Integrated several simulation and data processing pipelines using Python and Docker, including OpenFOAM simulation, Gaussian Process Regression, 3D data visualization using VTK and Plotly.
- Developed web APIs using ASP.NET Core and React, for GitHub/OAuth integration.
- Managed Kubernetes deployments using Helm and Terraform.

Emerson Automation Solutions

Oxford, UK

Senior Software Developer,

Oct 2021 – Aug 2024

- Tempest MORE Reservoir Simulator:
 - Improved parallel decomposition and load-balancing of fractures and locally refined grids.
 - Extended fault seal modelling capabilities to locally refined grids.
 - Leveraged Boost.Python and MPI for loading and decomposing custom user grid data.
 - Improved dynamic wellbore placement and well group management.
 - Added and improved documentation, tutorials and regression tests.
- Migrated license manager for Tempest MORE (C++), LIFT (C) and ENABLE (Java) from FlexLM to AspenONE SLM.
- Upgraded the build platforms and fixed security issues in the Tempest MORE and LIFT.
- Improved Pytest parallel scripts, reducing the main Jenkins pipeline duration by half.

Imperial College

London, UK

Research Associate,

May 2013 – 2019

Research Fellow,

2019 – Sep 2021

- Developed novel pore-network extraction, 3D surface tracking and flow models.
 - Open-sourced the [classical counterparts on GitHub](#).
- Developed C++ and Python pipelines for the analysis and visualisation of 3D networks.
- Created Python packages for data analysis and model calibration.
- Designed a parallel C++ library for 3D image processing, IO, compression, segmentation, registration and statistics, with [portions released on GitHub](#).
- Mentored MSc. and PhD students on coding projects such as [porefoam single-](#) and [two-phase](#) flow simulators and [ContactAngle](#) measurement.
- Coauthored 30+ journal papers and presented at 50+ conferences and workshops.

IRock Technologies,

London, UK

Consultant,

2014 – 2016

- Dual network and Darcy modelling of flow through heterogeneous porous media.

Imperial Consultants,

London, UK

Consultant,

2011 – 2013

- Pressure signal analysis using analytical solutions of partial differential equations.
- Conducted parameter estimation/optimisation and what-if scenario analysis, creating significant value for the client.

EDUCATION

Imperial College,

London, UK, 2009 – 2013, PhD

Thesis: Modelling multi-phase flow on micro-CT images of pore space.

Funding: Imperial College Consortium on Pore-scale Modelling.

Sharif University of Technology,

Tehran, Iran, 2006 – 2009 , MSc

Major: Hydrocarbon Reservoir Engineering.

Thesis: Flow through dual-porosity media using Finite-Elements in logarithmic spaces.

Petroleum University of Technology,

Ahwaz, Iran, 2002 – 2006, BSc

Major: Petroleum Reservoir Engineering.

Thesis: Simulation of foam-injection enhanced oil recovery.

1. **AQ Raeini**, LM Giudici, MJ Blunt, B Bijeljic, [Generalized network modelling of two-phase flow in a water-wet and mixed-wet reservoir sandstone: Uncertainty and validation with experimental data](#), *Advances in Water Resources*, 164, 104194 (2022)
2. AM Seleem, N Agenet, Y Gao, **AQ Raeini**, MJ Blunt, B Bijeljic, [Pore-scale imaging and analysis of low salinity waterflooding in a heterogeneous carbonate rock at reservoir conditions](#), *Scientific Reports*, 11 (1), 15063 (2021)
3. K Singh, BP Muljadi, **AQ Raeini**, C Jost, V Vandeginste, MJ Blunt, G Theraulaz, P Degond, [The architectural design of smart ventilation and drainage systems in termite nests](#), *Science Advances*, 5(3), eaat8520, (2019)
4. **AQ Raeini**, J Yang, I Bondino, T Bultreys, MJ Blunt, B Bijeljic, [Validating the generalized pore network model using micro-CT images of two-phase flow](#), *Transport in Porous Media*, 130 (2), 405–24 (2019)
5. M Shams, **AQ Raeini**, MJ Blunt, B Bijeljic, [A numerical model of two-phase flow at the micro-scale using the volume-of-fluid method](#), *Journal of Computational Physics*, 357, 159–182 (2018)
6. **AQ Raeini**, B Bijeljic, MJ Blunt, [Generalized network modelling: Capillary-dominated two-phase flow](#), *Physical Review E*, 97 (2), 023308, (2018)
7. **AQ Raeini**, B Bijeljic, MJ Blunt, [Generalized network modeling: Network extraction as a coarse-scale discretization of the void space of porous media](#), *Physical Review E*, 96 (1), 013312 (2017)
8. A AlRatrou, **AQ Raeini**, B Bijeljic, MJ Blunt, [Automatic measurement of contact angle in pore-space images](#), *Advances in Water Resources*, 109, 158–69 (2017)
9. BP Muljadi, MJ Blunt, **AQ Raeini**, B Bijeljic, [The impact of porous media heterogeneity on non-Darcy flow behaviour from pore-scale simulation](#), *Advances in Water Resources*, 95, 329–40, (2015)
10. **AQ Raeini**, MJ Blunt, B Bijeljic, [Direct simulations of two-phase flow on micro-CT images of porous media and upscaling of pore-scale forces](#), *Advances in Water Resources*, 74, 116–26, (2014)
11. **AQ Raeini**, B Bijeljic, MJ Blunt, [Numerical Modelling of Sub-pore Scale Events in Two-Phase Flow Through Porous Media](#), *Transport in Porous Media*, 101 (2), 191–213, (2014)
12. **AQ Raeini**, MJ Blunt, B Bijeljic, [Modelling two-phase flow in porous media at the pore scale using the volume-of-fluid method](#), *Journal of Computational Physics*, 231 (17), 5653–68 (2012)
13. **AQ Raeini**, M Masihi, A Shojaei, [Fracture reservoir simulation using finite element method with logarithmic shape functions](#), *Iranian Journal of Chemical Engineering*, 10(54):8-21 (2011)