Contribution ID: **1076** Type: **Poster Presentation**

DeepAngle: Deep-learning-based estimation of the contact angle distribution in tomography images of porous media

Tuesday, 23 May 2023 10:30 (1h 30m)

DeepAngle uses machine learning to determine contact angles between different phases in the tomography images of porous materials. The measurement of these angles in 3D can be inaccurate and time-consuming due to the discretized space of image voxels. A computationally intensive solution involves fitting and vectorizing all surfaces using an adaptable grid to measure angles between the desired vectorized planes. However, the present study offers an alternative low-cost technique that utilizes deep learning to estimate interfacial angles directly from images. DeepAngle was tested on synthetic and realistic images and was found to improve the r-squared of predicted angles by 5 to 16%, while reducing computational costs by 20 times. This rapid method is particularly useful for processing large tomography data and time-resolved images that are computationally intensive. The developed code and the dataset are available in a public repository on GitHub at [https://www.github.com/ArashRabbani/DeepAngle].

Note: An extended version of this poster has been accepted for publication by in Journal of Geoenergy Science and Engineering.

Participation

In-Person

References

MDPI Energies Student Poster Award

No, do not submit my presenation for the student posters award.

Country

United Kingdom

Acceptance of the Terms & Conditions

Click here to agree

Energy Transition Focused Abstracts

Primary authors: Dr RABBANI, Arash (The University of Leeds); BABAEI, Masoud (University of Manchester); MOSTAGHIMI, Peyman; ARMSTRONG, Ryan; NIASAR, Vahid (University of Manchester); SUN, Chenhao (University of New South Wales)

Presenter: Dr RABBANI, Arash (The University of Leeds)

Session Classification: Poster

Track Classification: (MS15) Machine Learning and Big Data in Porous Media