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Type: **Poster (+) Presentation**

Deep learning for digital rock image segmentation in pore structure characterization

Friday, 4 June 2021 09:40 (1 hour)

Accuracy of rock image segmentation is the base of digital rock, and decides the credibility of subsequent physical calculation. However, it spends much time to acquire perfect segmentation result. Benefitting from the advances in hardware and algorithms, deep learning has been widely used in image process for it doesn't need the complex image preprocessing comparing with conventional segmentation method. In this work, Segnet, a deep convolutional encoder-decoder architecture for image segmentation, was used to classify pore, matrix or fluid phase in CT images. Two datasets are used to demonstrate the capability of Segnet: the shale images conduct to distinguish two phases (pore and matrix), and the Doddington sandstone data is used to divide into three phases (pore, matrix and fluid phase). Each dataset is composed by 3000 images with 256×256 voxels respectively, 80% of them was used for training, 10% for testing and 10% for validation. The accuracy of segmentation of each phase on validation dataset is great than 90%, the pore structure extracted from segmental images, such as porosity and fractal dimension, have little difference comparing with experimental result. The results demonstrate that the deep learning is applicable and greatly potential for segmentation in digital rock.

Time Block Preference

Time Block A (09:00-12:00 CET)

References

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Primary authors: Mr ZHAO, Jiuyu (China University of Petroleum(Beijing)); CAI, Jianchao (China University of Petroleum, Beijing)

Presenter: Mr ZHAO, Jiuyu (China University of Petroleum(Beijing))

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