Contribution ID: **25** Type: **Poster (+) Presentation**

Permeability Prediction via 3D Convolution Neural Networks

Thursday, 3 June 2021 20:00 (1 hour)

Subsurface fluid flow prediction is critical in many natural and industrial processes such as groundwater movement, oil extraction, and geological carbon dioxide sequestration. These processes are controlled by the permeability of the underground porous media (i.e., soil, rock, etc.). Traditionally, the permeability of porous media is determined via expensive and labor-intensive lab-based methods. More recently, advances in digital rocks technology have enabled permeability prediction via computational fluid dynamics simulations. However, these simulations remain computationally demanding and time consuming. These complications are barriers to characterizing subsurface media in a fast and efficient way, limiting direct flow simulation of porous media to only samples of few millimeters in size. Here, we present an efficient, data-driven model based on 3D Convolution Neural Networks (CNNs) that learns the morphological and topographical features of porous media from CT images and makes permeability predictions. Specifically, our model is capable of predicting the permeability of real porous media samples from only geometry input (end-to-end) in as few as 4 milliseconds with a low error cost (~10%).

Time Block Preference

Time Block C (18:00-21:00 CET)

References

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