Machine Learning Applications in Subsurface Flow Characterization

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Message from the Guest Editor

Prediction of subsurface flow and transport is essential in many energy and environmental applications such as enhanced hydrocarbon recovery, CO_2 geo-sequestration, groundwater flow, and contaminant transport. Given the intrinsic spatial heterogeneity of the subsurface environment and the nonlinearity of governing equations of fluid flow, the prediction of subsurface flow using high-fidelity computational fluid dynamics techniques becomes challenging in terms of computational complexity and cost. Data-driven and machine learning tools can potentially tackle these challenges by offering computationally efficient alternatives to physics-based models.

This Special Issue aims to bring together papers demonstrating the advancement of machine learning-based proxy models with the focus on forward and inverse problems related to subsurface flow and transport. We highly encourage studies on scientific machine learning frameworks such as physics-constrained deep learning algorithms, which incorporate scientific computing and data-driven models in subsurface flow problems.

Special Issue

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Message from the Editor-in-Chief

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