Special Issue

Generalized/Extended Finite Element Methods, Meshless Methods and Related Developments in Machine Learning

Message from the Guest Editor

In generalized/extended finite element methods and meshless methods, regular meshes or particles that are independent of the non-smooth properties of fundamental solutions are adopted, and the complexity of the resulting mesh generation is reduced significantly. ML methods construct loss functions based on sampling points so that they can also be viewed as instances of MMs. The objective of this Special Issue is twofold. The first aim is to collate the progress made in using GFEMs/XFEMs, MMs, ML, NNs, and PINNs in engineering computations and numerical solutions to partial differential equations. The second aim is to bridge the connection between GFEMs/XFEMs/MMs and ML/NNs to foster potential research directions. All topics related to GFEMs/XFEMs/MMs/ML/NNs are welcome, including but not limited to the following: high-precision algorithms, engineering applications, theoretical and mathematical analysis, nonlinearities, dynamic analysis, large deformations, multi-physics, evolving PDEs, high-dimensional PDEs, optimization, adaptive algorithms, and unfitted mesh methods.

Guest Editor

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Message from the Editor-in-Chief

The journal *Mathematics* publishes high-quality, refereed papers that treat both pure and applied mathematics. The journal highlights articles devoted to the mathematical treatment of questions arising in physics, chemistry, biology, statistics, finance, computer science, engineering and sociology, particularly those that stress analytical/algebraic aspects and novel problems and their solutions. One of the missions of the journal is to serve mathematicians and scientists through the prompt publication of significant advances in any branch of science and technology, and to provide a forum for the discussion of new scientific developments.

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