Special Issue

Machine Learning Applications in the Design and Analysis of Composite Materials

Message from the Guest Editors

This Special Issue aims to gather original research and review articles focused on the integration of machine learning techniques with theoretical, numerical, and experimental approaches in the field of composite materials. Topics may include, but are not limited to, property prediction, damage detection, optimization, and performance enhancement of fiber-reinforced and novel composite structures. The integration of machine learning with computational mechanics, material modeling, and experimental data offers a powerful framework to revolutionize composite analysis and design. This Special Issue aims to achieve the following: (1) develop machine learning models for accurate prediction of mechanical properties of composite materials; (2) investigate and classify failure mechanisms through data-driven techniques; (3) apply intelligent algorithms for damage detection and health monitoring; and (4) explore optimization strategies for material architecture and performance enhancement. Contributions that demonstrate practical, interpretable, and reliable machine learning solutions for these aims are especially encouraged.
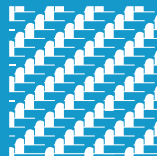
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