Special Issue

Advances in Mathematical Foundations of Deep Learning and Optimization

Message from the Guest Editors

This Special Issue focuses on mathematical and computational methods integrating data-driven learning, physical knowledge, simulation, and optimization for complex engineering systems.

Topics include, but are not limited to:

- Physics-informed and structure-informed learning
- Mathematical modeling of dynamical systems
- Surrogate and reduced-order modeling
- Constrained, multi-objective, robust, and stochastic optimization
- Uncertainty quantification and optimal control
- Reinforcement learning and learning-based decision-making
- Digital twins and intelligent engineering systems
- Prediction, simulation, and optimization for energy, manufacturing, transportation, and infrastructure

Particular interest is given to methods that enable reliable AI and optimization under limited data, physical laws, operational constraints, uncertainty, and dynamic environments. Original research, methodological studies, mathematically grounded applications, and review articles are welcome.

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