Fluids

an Open Access Journal by MDPI

CiteScore: 4.0
Impact Factor: 1.8

Special Issue Reprint

# Machine Learning and Artificial Intelligence in Fluid Mechanics

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Fluid mechanics research has evolved during the past few years towards the direction of exploiting massive amounts of data generated from knowledge gathered insofar, either from experimental measurements or simulations. The application of novel machine learning (ML) techniques is currently the latest trend in the field and has almost reached standardization. Computational boosting, advanced turbulence modeling, bridging among scales, hybrid simulation schemes, and flow feature extraction are concepts that scientists and engineers must deal with. This Reprint joins together data science methods and advanced artificial intelligence (AI) and ML techniques, in order to apply them to popular fluid mechanics problems, in an alternative though effective and accurate manner, strictly bound to the physical problem. Detailed reviews on the AI/CFD intersection and the future of ML in fluid dynamics can be found in this Reprint, along with novel research papers on topics related to scientific ML, physics-informed neural networks, intelligent fluid dynamics, industrial applications of AI, and explainable and trustworthy AI.

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