Special Issue

Efficiency and Scalability of Advanced Machine Learning and Optimization Methods for Real-World Applications

Message from the Guest Editor

Compared to synthetic mathematical problems, real-world problems pose distinct challenges and involve complex systems with interdependent components, which require advanced modelling and analysis techniques. To address these limitations, emerging methodologies such as transfer learning, federated learning, and quantum machine learning, must ensure their efficiency and scalability while processing extensive volumes of data. This Special Issue seeks submissions that not only present advanced techniques in this area, but also demonstrate improvements in their scalability and efficiency compared to existing approaches. The deployment of machine learning methods in real-world environments is of particular interest in this Issue. Case studies detailing the practical benefits and implementation challenges of these methods are invited. Discussions on the societal, ethical, and regulatory implications of deploying advanced machine learning systems are encouraged. Additionally, this Special Issue emphasizes techniques that accommodate the computational demands of large-scale datasets; benchmark datasets and evaluation metrics play a crucial role in addressing complex real-world problems.

Guest Editor

Dr. Mehdi Neshat

Faculty of Engineering and Information Technology, University of Technology Sydney, Sydney, Australia

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AI
Editorial Office
MDPI, Grosspeteranlage 5
4052 Basel, Switzerland
Tel: +41 61 683 77 34
ai@mdpi.com

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Editor-in-Chief

Prof. Dr. Kenji Suzuki
Biomedical Artificial Intelligence Research Unit (BMAI), Institute of Integrated Research, Institute of Science Tokyo, Yokohama 226-8501, Japan

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