Special Issue

Recent Advances in Quantum Machine Learning Technology

Message from the Guest Editors

Recent advancements in quantum technology have sparked significant interest in the application of quantum computing principles to machine learning. This has given rise to the field of quantum machine learning (QML). A central research goal in this field is to investigate if and when quantum computing principles can offer advantages over classical computing.

In recent years, this question has increasingly been investigated in the following two promising paradigms: quantum discriminative learning and quantum generative learning. They face significant limitations due to the currently available noisy, intermediate scale quantum (NISQ) devices. Additionally, recent works have revealed the adversarial vulnerability of quantum classifiers.

This Special Issue will focus on recent research aimed at advancing QML on NISQ devices through (a) identifying novel applications of QML with demonstrable advantages, (b) addressing NISQ-related challenges for QML with novel approaches to mitigate them, (c) enhancing the theoretical understanding of quantum machine learning.

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Deadline for manuscript submissions

20 October 2025

Applied Sciences

an Open Access Journal by MDPI

Impact Factor 2.5
CiteScore 5.5

mdpi.com/si/215912

Applied Sciences
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As the world of science becomes ever more specialized, researchers may lose themselves in the deep forest of the ever increasing number of subfields being created. This open access journal Applied Sciences has been started to link these subfields, so researchers can cut through the forest and see the surrounding, or quite distant fields and subfields to help develop his/her own research even further with the aid of this multi-dimensional network.

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