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Quantum Machine Learning

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Quantum Machine Learning (QML) is where nowadays machine learning is going to meet quantum information science in order to realize more powerful quantum technologies. In particular, several QML schemes can arise according to the fact that the data to be processed and the algorithm processing them can be either classical or quantum. Moreover, the learning algorithms can be unsupervised, supervised and goal-oriented (reinforcement learning). Here, we will discuss our recent theoretical and experimental results focusing on quantum embedding, quantum state discrimination, noise sensing, quantum generative adversarial networks, and quantum reinforcement learning. QML is expected to provide huge advantages over its classical counterpart, and deeper investigations are timely needed since they can be already tested on the commercially available quantum devices.

Primary author(s) : Prof. CARUSO, Filippo (Dipartimento di Fisica e Astronomia, Università degli Studi di Firenze)

Presenter(s) : Prof. CARUSO, Filippo (Dipartimento di Fisica e Astronomia, Università degli Studi di Firenze)

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