



## QUANTUM MACHINE LEARNING SEMINARS

### G. SERGIOLI

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University of Cagliari

#### *QUANTUM-LIKE MACHINE LEARNING - THEORETICAL REASONING AND EMPIRICAL APPLICATIONS*

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The aim of the talk is to introduce a new quantum-like method for the binary classification applied to classical datasets. Inspired by the quantum Helstrom measurement, this approach enables to define a new binary classifier, called Helstrom Quantum Classifier (HQC). We show that HQC outperforms the other classifiers when compared to the Balanced Accuracy and other significant statistical measures. We also show that the performance of our classifier is positively correlated to the increase in the number of "quantum copies" of a pattern and the resulting tensor product thereof.

### M. GROSSI

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IBM Italy & University of Pavia

#### *POLARIZATION DISCRIMINATION IN VECTOR BOSON SCATTERING*

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The main aim of the study presented in this talk is to find an optimal method to identify the contribution of longitudinally polarized W bosons in the Vector Boson Scattering (VBS) process as an important probe of a previously untested sector of the standard model. A comparison using innovative hybrid or fully quantum machine learning approaches, like Quantum Support Vector Machine (QSVM), is presented, as a natural further step in this kinematics study that could help the understanding of vector boson scattering analysis.

**DATE:** December 16, 2020

**TIME:** 16:30 – 18:30

**ZOOM LINK:** <https://univr.zoom.us/j/87646180055>

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