

Quantum machine learning

(F. Chapeau-Blondeau, LARIS ISISV, 17 mars 2021)

- V. Dunjko, H. J. Briegel; "Machine learning & artificial intelligence in the quantum domain: a review of recent progress."; *Reports on Progress in Physics* 81, 074001,1-67 (2018).
- J. Biamonte, *et al.*; "Quantum machine learning"; *Nature*, vol. 549, pp. 195-202 (2017).
- N. Wiebe, A. Kapoor, K. M. Svore; "Quantum deep learning"; *Quantum Information & Computation* 16, 541-587 (2016).

Specific quantum properties : superposition, entanglement, tunneling, ...
for enhanced performance.

Algorithms, hardware, applications are open for research.

Industries involved : Intel, IBM, Microsoft, Google, ...
Atos, Thales, Total, EDF, Airbus, Orange, Gemalto, ...

Already D-Wave commercial quantum computer (~5000 qubits) for quantum annealing optimization.

À croiser avec approches classiques : traitement signal, traitement d'images, automatique, machine learning, méthodes ensemblistes, optimisation, systèmes à événements discrets, etc.

2020-2021 : Un stage M2 SDS (N. Delanoue, FCB), un projet M2 PSI (David R).

Basics from my Ref. [D25] http://perso-laris.univ-angers.fr/~chapeau/papers/docs/qi_stim2019_web.pdf