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Seminar des Instituts für Quantenphysik

Dr. Sabine Wölk
Universität Innsbruck

Reinforcement learning in quantum information

Donnerstag, den 15.11.2018
11:00 Uhr
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Abstract: The past decade has seen the parallel advance of two research areas—quantum computation and artificial intelligence — from abstract theory to practical applications and commercial use. Despite this seemingly simultaneous emergence and promise to shape future technological developments, the overlap between these areas still offers a number of unexplored problems. It is hence of fundamental and practical interest to determine how quantum information processing and autonomously learning machines can mutually benefit from each other.

In this talk, I will give an introduction to learning agent based on projective simulation and give examples how classical learning can help in quantum experiment as well as how we can enhance learning agent with the help of quantum information.

[1] V. Dunjko, J. M. Taylor and H.J. Briegel, “Quantum-enhanced machine learning”, Phys. Rev. Lett. 117, 130501 (2016)

[2] Th. Sriarunothai, S. Wölk, G. Sh. Giri, N. Friis, V. Dunjko, H. J. Briegel and Ch. Wunderlich, “Speeding-up the decision making of a learning agent using an ion trap quantum processor ”, arXiv: 1709.01366