



Cluster of Excellence Machine Learning: New Perspectives for Science

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Cluster Colloquium "Machine Learning" Seminar Series of the Cluster of Excellence

Wednesday February 05, 2020

2:00 - 3:00 pm, followed by Get Together

Lecture Hall, AI Research Building

Maria von Linden-Str. 6 (ground floor), 72076 Tübingen

Learning and artificial intelligence in the quantum domain

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(Host: Eric Raidl)

Quantum mechanics has changed the way we think about the scope and possibilities of information processing, and the foundations of computer science. In this talk, I will discuss the role of quantum information for artificial intelligence, and vice versa. This will include the use of learning agents in quantum physics laboratories, as well as the use of quantum information in machine learning and artificial-agent design. I will focus on the model of projective simulation (PS), which employs random-walk processes in the agent's memory for learning and decision-making. Projective simulation has been applied, e.g., in autonomous robotic playing, the modelling of collective behavior, and the autonomous design of quantum experiments. The PS model can be naturally quantized, allowing for a speed-up of the agent's decision making process. I will review some recent results of our research on (classical and) quantum-enhanced learning agents and their applications.