Fakultät für Mathematik, Informatik und Physik
Universität Innsbruck

Ankündigung des öffentlichen Vortrags („defensio dissertationis“)

im Rahmen der abschließenden kommissionellen Prüfung (Rigorosum)
im Doktoratsstudium Physik , Diplomstudium Physik

von

Alexey Melnikov

über

“A physics approach to classical and quantum machine learning with applications in quantum experiment”

Zeit: Montag, 24.September 2018,10:00 Uhr
Ort: ICT Gebäude Seminarraum 1

Inhalt:

Today machine learning plays an increasing role in many aspects of our daily life. What can be the role of machine learning in quantum physics and, vice versa, the role of quantum physics in machine learning? This thesis addresses both questions by connecting quantum physics and machine learning, specifically reinforcement learning, from two directions: reinforcement learning helps in solving quantum physics problems, and quantum effects improve the performance of reinforcement learning algorithms. Both directions are considered by using the projective simulation model.

In my talk, I will first present theoretical investigations and developments of the projective simulation model in the context of reinforcement learning. Next, I will demonstrate how the model can be used to design novel quantum experiments and discover experimental techniques. Finally, I will show how to implement probability unitaries for quantum-enhanced projective simulation in superconducting quantum circuits.

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