Joint Annual Meeting of the Swiss and Austrian Physical Society 2023



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Type: Talk

[806] Hybrid Variational Classical-Quantum Computing: Ingredients to make it work

Thursday 7 September 2023 15:30 (30 minutes)

Parameterized quantum circuits serve as ansätze for solving variational problems and provide a flexible paradigm for programming near-term quantum computers. Here we discuss three fundamental criteria for this paradigm to be effective: expressibility, trainability and generalisability. We will introduce these concepts and present recent analytic progress quantifying to what extent these criteria can be achieved. While more generally applicable, the discussion will be framed around the example of trying to variationally learn an unknown quantum process. We will end with some more open-ended dreaming about the applications of these ideas for experimental quantum physics and quantum compilation.

Theoretical Work

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