Mathematical Picture Language Seminar

Tuesday, September 27

9:30 a.m. Boston time

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A Single T-Gate Makes Quantum Distribution Learning Hard

Abstract: In this talk, we will have a look at quantum-assisted machine learning and discuss the comparative power of classical and quantum learners for generative modelling. In light of new findings on the PAC learnability of output distributions of local quantum circuits, we will discuss how much structure is actually expected to be required to hope for quantum advantages in quantum-assisted machine learning. We prove that the injection of a single T-gate into Clifford circuits renders the task of learning evaluators from samples infeasible in polynomial time. This is in stark contrast to the case of Clifford circuits for which we provide an efficient learning algorithm based on Gaussian elimination. This work will provide a roadmap of next steps to be taken for work in quantum machine learning and will flesh out the potential and limitations of quantum probabilistic modelling.

Zoom QR Code & Link:
https://harvard.zoom.us/j/779283357?pwd=MitXVm1pYUlJVzZqT3lwV2pCT1ZUQT09

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