



Canadian Association
of Physicists

Association canadienne
des physiciens et physiciennes

Contribution ID: 692

Type: **Invited Speaker / Conférencier(ère) invité(e)**

(I) Classical and quantum control and learning

Tuesday 8 June 2021 16:00 (30 minutes)

Control systems are vital in engineering, and machine learning is transforming data science; however, their basic constructs are expressed in terms of classical physics, which impedes generalizing to quantum control and quantum machine learning in a consistent way. We incorporate classical and quantum control and learning and their dependencies into a single conceptual framework. Then we discuss inconsistencies between current definitions of quantum control and quantum learning vs their descriptions achieved by generalizing classical versions using our framework. We illustrate our framework in the context of quantum-enhanced interferometric-phase estimation, which incorporates both control and machine learning.

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Session Classification: TS-2 Quantum Machine Learning (DTP) / Apprentissage automatique quantique (DPT)

Track Classification: Symposia Day (DTP) - Quantum Machine Learning