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Robust Online Hamiltonian Learning[1] CHRISTOPHER GRANADE, Institute for Quantum Computing, CHRISTOPHER FERRIE, Center for Quantum Information and Control, NATHAN WIEBE, DAVID CORY, Institute for Quantum Computing — In this talk, we introduce a machine-learning algorithm for the problem of inferring the dynamical parameters of a quantum system, and discuss this algorithm in the example of estimating the precession frequency of a single qubit in a static field. Our algorithm is designed with practicality in mind by including parameters that control trade-offs between the requirements on computational and experimental resources. The algorithm can be implemented online, during experimental data collection, or can be used as a tool for post-processing. Most importantly, our algorithm is capable of learning Hamiltonian parameters even when the parameters change from experiment-to-experiment, and also when additional noise processes are present and unknown. Finally, we discuss the performance of the our algorithm by appeal to the Cramer-Rao bound.

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