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Bayesian Optimization for Variational Quantum Eigensolvers

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The Variational Quantum Eigensolver (VQE) is a hybrid quantum-classical algorithm used to find the spectrum of a Hamiltonian using the variational method. In particular, this procedure can be used to study LGT in the Hamiltonian formulation. Bayesian Optimization (BO) based on Gaussian Process Regression (GPR) is a powerful algorithm for finding the global minimum of the energy with a very low number of iterations. This work explores some available methods for BO and GPR, and proposes a setup that is specifically tailored to perform VQE with NISQ devices.

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