Title

Machine Learning Quantum Emergence

Abstract

Decades of efforts in improving computing power and experimental instrumentation were driven by our desire to better understand the complex problem of quantum emergence. However, increasing volume and variety of data made available to us today present new challenges. I will discuss how these challenges can be embraced and turned into opportunities by employing machine learning. The rigorous framework for scientific understanding physicists enjoy through our celebrated tradition requires the interpretability of any machine learning essential. I will discuss our recent results using machine learning approaches designed to be interpretable from the outset. Specifically, I will present discovering order parameters and its fluctuations in voluminous X-ray diffraction data and discovering signature correlations in quantum gas microscopy data.