Abstract:
Computers are physical systems and thus work according to the laws of physics; conversely, physical systems can be thought of as computers processing information. Thus when we discover new laws of physics how we understand computation is greatly affected. In principle quantum computers allow us to calculate things that are very difficult or perhaps impossible to calculate, classically. But it is notoriously difficult to find algorithms that take advantage of the power of quantum computing. A neural network in a sense programs itself, by learning the desired function. Quantum learning offers a new method for construction of quantum algorithms.