Quantum Cellular Automata

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In order to simulate quantum systems efficiently, we ought to use quantum systems. The framework of Quantum Cellular Automata (QCA), including Quantum Walks, is a strategic for quantum simulation. First, because QCA constitute a privileged mathematical setting in which to discretize the quantum system to be simulated. Secondly, because they constitute a promising architecture for quantum simulation devices. Last, because the imperfections of the quantum simulation devices are more likely to map onto the natural noise models of the simulated quantum phenomena. I will review a number of theoretical results on quantum simulation with QCA.