

Quantum walks

Random walks are a well studied concept, that has been extensively used in many areas of science with notorious success. Meanwhile, quantum science has made an enormous step forward, from the initial Feynman papers to the first quantum computers. We try to give a small but self-consistent and pedagogical insight into the question of how quantum analogies to random walks are being developed in research literature. Classical random walks are introduced from the graph theory point of view as an inspiration for the discrete step quantum evolution. An example of potential quantum algorithm is presented. The work is concluded by introducing original computational results of quantum walks as possible quantum simulators of particles moving under a magnetic field in a 2D lattice.

Summary

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