Quantum Mechanical Initial State Approximation

Technology #m04-014

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Quantum Mechanical System Quantum State Calculation Methods and systems to efficiently calculate eigenvalues and eigenvectors and systems for efficiently calculating an approximate quantum state to be used as an input in a quantum mechanical system are described.

A method for approximating an eigenvalue of an eigenproblem with a quantum computer involves obtaining an eigenvector from a course discretization of the eigenproblem. The eigenvector is stored in a quantum register. The quantum register is appended to the eigenvector and a Hadamard transformation is performed on each of the eigenvector. The system for computing an eigenvalue acts as a means of storing eigenvector in a quantum register. A means for appending and for performing a Hadamard transformation is provided.

The method can be used for solving continuous Hermitian eigenproblems, e.g. the Schrödinger equation, on a discrete grid. ”

Inventors

Anargyros Papageorgiou