Spector

Automatic Quantum Computer Programming

A Genetic Programming Approach

Once realized, the potential of large-scale quantum computers promises to radically transform computer science. Despite large-scale international efforts, however, essential questions about the potential of quantum algorithms are still unanswered. The application of automatic programming technologies, particularly genetic programming techniques, has produced several new quantum algorithms. These methods will help to guide theoretical work on both the power and limits of quantum computing, and lead to the discovery of new solutions to practical problems using quantum computers. Automatic Quantum Computer Programming is an introduction both to quantum computing for non-physicists and to genetic programming for non-computer-scientists. The book explores several ways in which genetic programming can support automatic quantum computer programming and presents detailed descriptions of specific techniques, along with several examples of their human-competitive performance on specific problems.

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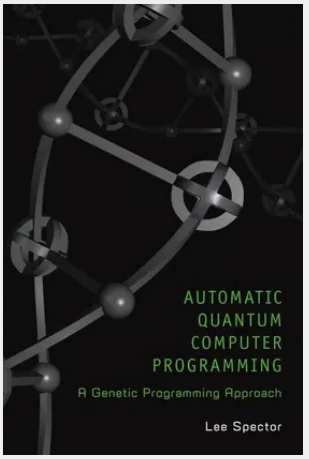

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