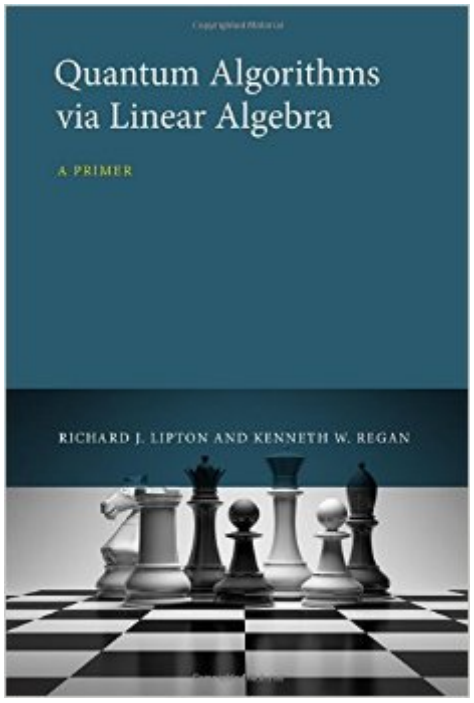
Quantum Algorithms Via Linear Algebra: A Primer (MIT Press)



Synopsis

This introduction to quantum algorithms is concise but comprehensive, covering many key algorithms. It is mathematically rigorous but requires minimal background and assumes no knowledge of quantum theory or quantum mechanics. The book explains quantum computation in terms of elementary linear algebra; it assumes the reader will have some familiarity with vectors, matrices, and their basic properties, but offers a review of all the relevant material from linear algebra. By emphasizing computation and algorithms rather than physics, this primer makes quantum algorithms accessible to students and researchers in computer science without the complications of quantum mechanical notation, physical concepts, and philosophical issues.After explaining the development of quantum operations and computations based on linear algebra, the book presents the major quantum algorithms, from seminal algorithms by Deutsch, Jozsa, and Simon through Shor's and Grover's algorithms to recent quantum walks. It covers quantum gates, computational complexity, and some graph theory. Mathematical proofs are generally short and straightforward; quantum circuits and gates are used to illuminate linear algebra; and the discussion of complexity is anchored in computational problems rather than machine models. Quantum Algorithms via Linear Algebra is suitable for classroom use or as a reference for computer scientists and mathematicians.

Book Information

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Customer Reviews

Where it's at. A necessary introduction to practical Quantum Computer programming.Especially

useful for those looking for a secure professional future and a path to get there.

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