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Advanced Tutorials on Quantum Circuits

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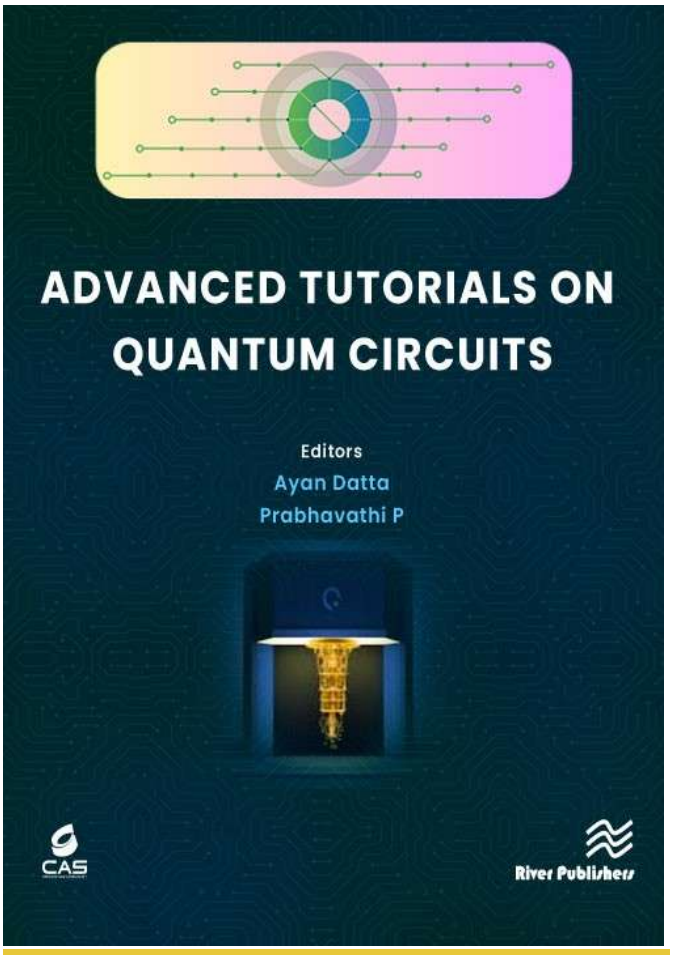

This book explores quantum circuits, which operate on qubits rather than traditional binary bits. They exploit the principles of superposition and entanglement, allowing them to perform complex computations that classical computers cannot. These circuits hold immense potential for breakthroughs in fields such as optimization, cryptography, and materials science. For example, quantum algorithms like the quantum approximate optimization algorithm (QAOA) have shown promise in solving real-world problems with greater speed and efficiency than classical methods. This book looks at multiple ways how quantum computing is growing as a technology with chapters on tools, applications, algorithms, as well as directions and prospects for future research.

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