1. Record Nr. UNINA9910789342103321

Titolo	Lectures on quantum computing, thermodynamics and statistical physics [[electronic resource] /] / editors, Mikio Nakahara, Shu Tanaka
Pubbl/distr/stampa	Singapore ; ; Hackensack, NJ, : World Scientific Pub., c2013
ISBN	981-4425-19-2
Descrizione fisica	1 online resource (199 p.)
Collana	Kinki University series on quantum computing ; ; vol. 8
Altri autori (Persone)	NakaharaMikio TanakaShu
Disciplina	004.1 530.12
Soggetti	Statistical physics Thermodynamics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Preface; CONTENTS; Quantum Annealing: From Viewpoints of Statistical Physics, Condensed Matter Physics, and Computational Physics Shu Tanaka and Ryo Tamura; 1. Introduction; 2. Ising Model; 2.1. Magnetic Systems; 2.2. Nuclear Magnetic Resonance; 3. Implementation Methods of Quantum Annealing; 3.1. Monte Carlo Method; 3.2. Deterministic Method Based on Mean-Field Approximation; 3.3. Real-Time Dynamics; 3.4. Experiments; 4. Optimization Problems; 4.1. Traveling Salesman Problem; 4.1.1. Monte Carlo Method; 4.1.2. Quantum Annealing; 4.1.3. Comparison with Simulated Annealing and Quantum Annealing 4.2. Clustering Problem 5. Relationship between Quantum Annealing and Statistical Physics; 5.1. Kibble-Zurek Mechanism; 5.1.1. Efficiency of Simulated Annealing and Quantum Annealing; 5.1.2. Simulated Annealing for Random Ferromagnetic Ising Chain; 5.1.3. Quantum Annealing for Random Ferromagnetic Ising Chain; 5.1.4. Comparison between Simulated and Quantum Annealing Methods; 5.2. Frustration Effects for Simulated Annealing and Quantum Annealing; 5.2.1. Thermal Fluctuation and Quantum Fluctuation Effect of Geometrical Frustrated Systems 5.2.2. Non-Monotonic Behavior of Correlation Function in Decorated Bond System 6. Conclusion; Acknowledgement; References; Spin Glass: A Bridge between Quantum Computation and Statistical Mechanics

Masayuki Ohzeki; 1. Introduction: Statistical Mechanics and Quantum Mechanics; 2. Training: Statistical Mechanics; 2.1. Student's misreading point: Probability is...; 2.2. Probability describes... a certain behavior; 2.3. Large deviation property; 2.4. Mean-field analysis; 2.5. Phase transition; 2.6. Spin glasses; 2.7. Gauge theory; 3. Quantum Error Correction: Surface Code; 3.1. Error model
3.2. Surface code 3.2.1. Check operators and error syndrome; 3.2.2. Probability of error chains; 3.3. Analyses on accuracy thresholds for surface code; 3.3.1. Duality analysis: Simple case; 3.3.2. Duality analysis: Spin glass; 3.3.3. Duality analysis with real-space renormalization; 3.3.4. Other cases; 3.3.5. Depolarizing channel; 4. Quantum Annealing and Beyond; 4.1. Quantum adiabatic computation: Short review; 4.2. Novel type of quantum annealing; 4.2.1. Classical quantum mapping; 4.2.2. Jarzynski equality; 4.2.3. Quantum Jarzynski annealing; 4.2.4. Problems in measurement of answer
4.3. Non-adiabatic quantum computation 4.3.1. Jarzynski equality for quantum system; 4.3.2. Performance of non-adiabatic quantum annealing; 4.4. Analyses on non-adiabatic quantum annealing; 4.4.1. Gauge transformation for quantum spin systems; 4.4.2. Relationship between two different paths of NQA; 4.4.3. Exact relations involving inverse statistics; 5. Summary; References; Second Law-like Inequalities with Quantum Relative Entropy: An Introduction Takahiro Sagawa; 1. Introduction; 2. Quantum States and Dynamics; 2.1. Quantum States and Observables; 2.2. Quantum Dynamics
2.2.1. Unitary Evolution

Sommario/riassunto

This book is a collection of lecture notes from the Symposium on Quantum Computing, Thermodynamics, and Statistical Physics, held at Kinki University in March 2012. Quantum information theory has a deep connection with statistical physics and thermodynamics. This volume introduces some of the topics on interface among the mentioned fields. Subjects included in the lecture notes include quantum annealing method, nonequilibrium thermodynamics and spin glass theory, among others. These subjects were presented with much emphasis put in its relevance in quantum information theory. These lecture not

2. Record Nr. UNINA9910138941203321

Titolo	2009 First International Conference on Advances in System Testing and Validation Lifecycle
Pubbl/distr/stampa	[Place of publication not identified], : IEEE, 2009
ISBN	9781509070244 1509070249 9780769537740 076953774X
Descrizione fisica	1 online resource : illustrations
Disciplina	001.64250287
Soggetti	Computer programs - Testing Computer programs - Validation
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Bibliographic Level Mode of Issuance: Monograph