IOPscience

ACCEPTED MANUSCRIPT

Perspectives of quantum annealing: Methods and implementations

Philipp Hauke[1] iD, Helmut G Katzgraber[2], Wolfgang Lechner[3], Hidetoshi Nishimori[4] and William D Oliver[5] iD

Accepted Manuscript online 1 April 2020 • © 2020 IOP Publishing Ltd

What is an Accepted Manuscript?

philipp.hauke@mytum.de

[1] Department of Physics , University of Trento, Trento, Trentino-Alto Adige, ITALY

[2] Microsoft Corp, Redmond, Washington, UNITED STATES

[3] Quantum Optics and Quantum Information, Institut fur Quantenoptik und Quanteninformation, Innsbruck, AUSTRIA

[4] Tohoku University, Sendai, Miyagi, JAPAN

[5] MIT, Cambridge, Massachusetts, UNITED STATES

Philipp Hauke iD https://orcid.org/0000-0002-0414-1754

William D Oliver iD https://orcid.org/0000-0001-8041-0824

Abstract

Quantum annealing is a computing paradigm that has the ambitious goal of efficiently solving large-scale combinatorial optimization problems of practical importance. However, many challenges have yet to be overcome before this goal can be reached. This perspectives article first gives a brief introduction to the concept of quantum annealing, and then highlights new pathways that may clear the way towards feasible and large scale quantum annealing. Moreover, since this field of research is to a strong degree driven by a synergy between experiment and theory, we discuss both in this work. An important focus in this article is on future perspectives, which complements other review articles, and which we hope will motivate further research.

Export citation and abstract   BibTeX   RIS

Access this article

Login options

or

via Athens/Shibboleth

The computer you are using is not registered by an institution with a subscription to this article. Please log in below. Find out more about journal subscriptions at your site.

Make a recommendation

Recommend this journal

To gain access to this content, please complete the Recommendation Form and we will follow up with your librarian or Institution on your behalf.

Subscribe to this journal

Highlights collection