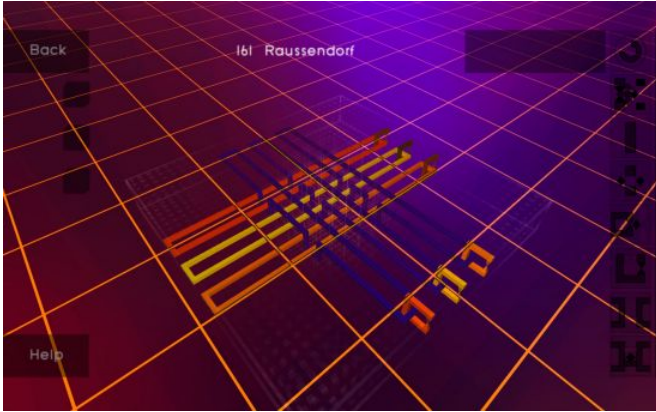


MeQuanics: Let's play quantum computation for serious results

10 October 2016, by Nancy Owano



(Tech Xplore)—Can a 3-D puzzle become a favored tool of quantum software engineers? There is reason to hope for Japan-based Simon Devitt at the Center for Emergent Matter Science, Riken. Just play meQuanics, a 3-D puzzle game and he and colleagues will be very happy. The more players, the more hope they carry for their mission. (We will get to that in a minute.)

The game is hardly frivolous; it is based on the scientific principles governing quantum computation. This Web-based puzzle is called [meQuanics](#). You can play the prototype version, available now. [meQuanics](#).

Each puzzle in meQuanics represents a real quantum algorithm, "which needs to be optimized for a quantum computer to be realized with real quantum devices," said the project site.

"A fewer number of devices and a shorter run time increase our chance to build a real quantum computer. Reducing the resources necessary for a quantum computer is one of the most urgent and important problems to make this technology a

reality."

Essentially, they are on a mission to gamify for useful results. "It's a bit buggy but it looks good and is worth a try if you have a few minutes," said *MIT Technology Review*. "MeQuanics is important—the process of playing the game creates a database of examples that can be used to train a [machine](#)."

You can read more about this and the thinking behind it in the paper, "[Programming quantum computers using 3-D puzzles, coffee cups, and doughnuts](#)" by Simon Devitt, which is now up on arXiv. The article appeared in the Fall 2016 issue of ACM-XRDS. The reference list in this arXiv version was expanded.

He wrote: " An initial prototype of a platform we have dubbed meQuanics [[www.mequanics.com.au](#)], designed to convert the topological optimization problem into a simple 3-D puzzle game, has been released online. Designed for touch-based platforms such as smartphones and tablet devices, meQuanics creates an online social media environment."

Point is, this is where the public gets to lend a hand in finding "small volume solutions to various quantum sub-circuits that are critical for largescale quantum computation."

The project site said that meQuanics will be further developed "into a real game to help us program quantum computers."

MIT Technology Review said, "One way to think about a quantum program is as a two-dimensional lattice of qubits, like a sheet, or a three-dimensional lattice, like a crystal. Information is encoded by creating a hole or defect in the lattice." Where Devitt steps in: he developed a "powerful way to visualize quantum programs as 3-D lattices with interlocking sections representing the way information is stored and processed," said *MIT*

Technology Review.

In the bigger picture, Devitt wrote that "Quantum information technology is currently experiencing a second renaissance in advancement and investment from both the public and private sectors. As such, there is consensus amongst experts that it is no longer a question of if a large-scale quantum computer can be built, but when."

More information: Programming quantum computers using 3-D puzzles, coffee cups, and doughnuts, arXiv:1609.06628 [quant-ph]
arxiv.org/abs/1609.06628

Abstract

The task of programming a quantum computer is just as strange as quantum mechanics itself. But it now looks like a simple 3D puzzle may be the future tool of quantum software engineers.

© 2016 Tech Xplore

APA citation: MeQuanics: Let's play quantum computation for serious results (2016, October 10)
retrieved 14 October 2019 from <https://techxplore.com/news/2016-10-mequanics-quantum-results.html>

This document is subject to copyright. Apart from any fair dealing for the purpose of private study or research, no part may be reproduced without the written permission. The content is provided for information purposes only.