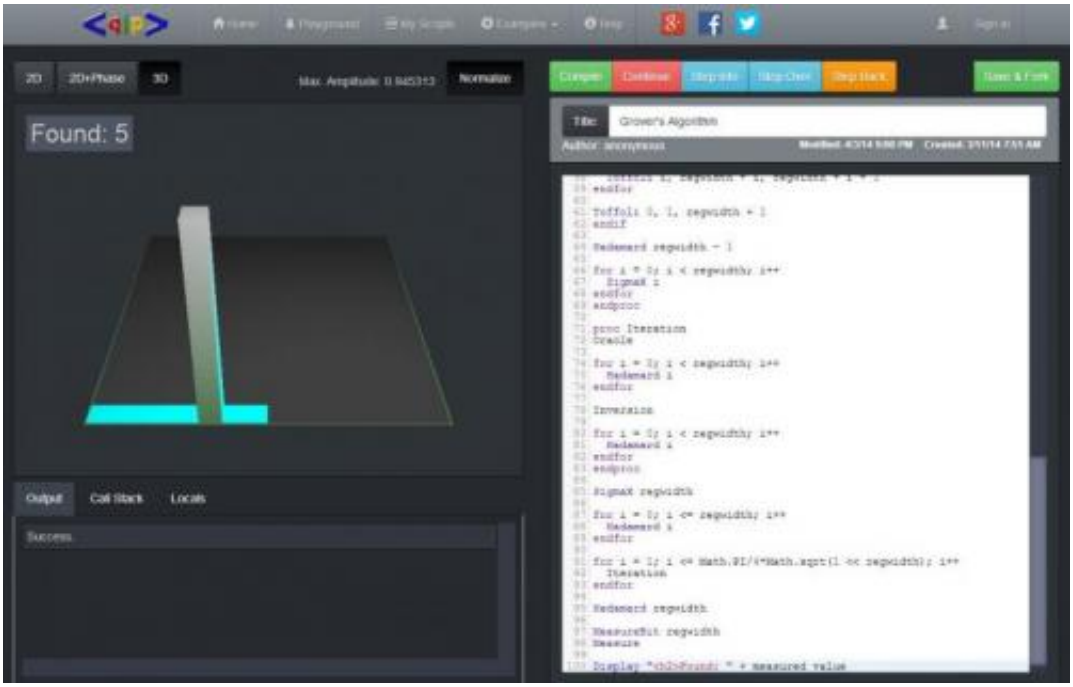
Google engineers open gates to Quantum Computing Playground

May 23 2014, by Nancy Owano



Does the idea of playing about with a quantum computer please you? If so, you can check out one fresh alternative route, thanks to a group of Google engineers. How about a GPU-accelerated quantum computer? You can take advantage of something called the Quantum Computing Playground which has launched as a browser-based WebGL Chrome Experiment. It features a GPU-accelerated quantum computer with a simple IDE interface. It has its own scripting language, with debugging

and 3D quantum state visualization features.

Quantum Computing Playground can simulate quantum registers up to 22 qubits, run Grover's and Shor's algorithms, and has quantum gates built into the scripting language itself. Commenting, *ExtremeTech* said the programs are written in a language called QScript,-which "looks a lot like any other simple Bash-like scripting language."

The 'Playground' web page provides some background to quantum computers and how they are unique. "A classic computer processes bits, which at any given time can be in one of two states: 0 or 1. Quantum computers use qubits, which can exist in any superposition of states 0 and 1, and are represented by a complex number. When N qubits are in superposition, a combination of 2^N states is created. A classic computer can only hold one of these states at a time, while quantum computers can perform meaningful operations on superpositions of states. This basic property of quantum computers opens a way to multiple interesting algorithms."

The comments expressed by technology sites describing the new Quantum Computing Playground mentioned the lack of any detailed tutorial. They note that one needs some sort of programming experience to dig in and enjoy. Said *I Programmer*, for example: "One of the problems with using it is that it doesn't provide a course in quantum computing or quantum principles and to make much sense of it you need to know something about quantum mechanics and have a rough idea if what quantum gates are all about."

A step by step demo is provided along with some very useful information on the Help page but the need for previous exposure to the principles of quantum computing would be helpful. *ExtremeTech* said, "The Help/About page has a few details about the inner workings of the simulator and QScript, but you'll still need a pretty solid grounding in

computer science or quantum computer theory."

All the same, the Quantum Computing Playground needs little coaxing to draw the interest of those who are genuinely curious about working with quantum algorithms. "If you have ever wanted to try your hand at quantum algorithms, there is no longer an excuse," *I Programmer* said Thursday.

After all, according to the Playground site, quantum computers that perform operations on sequences of qubits are not available commercially. "The proof-of-concepts for capabilities of quantum computing have been demonstrated in multiple laboratories around the world, so there is a chance that quantum computers will become one day everyday's reality. For now, you can experience the technology of tomorrow today, inside our Playground."

More information: Quantum Computing Playground: qcplayground.withgoogle.com

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