

Do you want to play a quantum game?

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Researchers at the Japanese National Institute of Informatics (NII) in Tokyo have converted one of the most complicated problems in science into a fun puzzle game. And they want you to play it to help program a quantum computer.

Released today at www.mequanics.com, the Quantum Information Science Theory (QIST) team at NII is showcasing a preview of meQuanics: The Quantum Computer Game. meQuanics asks the public to help optimize quantum algorithms with a 3-dimensional puzzle.

“The puzzles represent actual quantum algorithms” says Simon Devitt, one of the leaders of the development team. “Quantum computers need quantum algorithms – and no one knows the best ones yet. In meQuanics when you play the game, you are actually manipulating and optimizing real quantum algorithms. The best solutions will be used when quantum computers become available.”

“Crowdsourcing hard physics problems in physics provides exciting opportunities for the future, and I’m very excited by what the NII team has achieved with this,” says Quantum Physicist Michelle Simmons, Director of the Centre of Excellence for Quantum Computation and Communication in Australia “there’s so much talent out there, the scientific community needs to tap into it”.

Inspired by similar games that exist within the biological sciences, meQuanics is the first scientific game related to quantum computing and the first for the large number of gaming-ready devices that people carry with them everyday. “We are providing the casual gamer with an exciting challenge that has real-world benefit.” says Klaus Brügmann, the game’s designer.

“NII is uniquely placed to host this platform for Open-Science” says Kae Nemoto, head of the QIST group at NII. The game will interface with computer servers at the National Institute of Informatics in Japan. The servers will rank solutions according to how well they optimize quantum algorithms, and the best solutions will form the basis of a programming language for quantum computers.

The rest of the team is Edern Grey (digital artist), and a multi-media and interactive systems expert, Helmut Prendinger from the Digital Content and Media Sciences Research Division at NII. Web-design is directed by Rue Ikeya, and Music is by Hibiki Ikeya.

Nemoto says that quantum computers promise to solve complex problems that are currently impossible on even the world’s largest supercomputers: “But programming these machines is extremely complicated. It’s an area of research that receives little attention.”

There has been an intense effort worldwide in the past 20 years to build the next generation of computers that will exploit the often strange rules of quantum mechanics. Recent breakthroughs have shown how to build small quantum computers in many

different systems. The team believes that it is no longer a question of *if* we can build quantum computers, but *when*. And meQuanics will be an important tool to start programming these computers efficiently.

The showcased version of meQuanics is a pre-release to gather feedback from both gamers and the quantum computing community. The meQuanics team will then develop the game during the summer to be released for tablet devices including iPad and Android Nexus. Devitt noted “Our goal is not just to generate needed scientific data, we also want to design a great game that is fun to play”.



Figure 1: Title screen for meQuanics

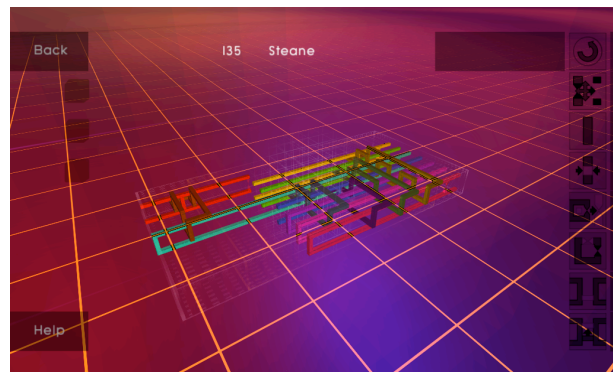


Figure 2: Main game screen, where a geometric puzzle is simplified to reduce resources in a real quantum computer.

Gamers will also have the opportunity to be authors on future scientific papers. “We want gamers to be motivated, one of the ways we can do that is offer people the opportunity to be a published scientist if they generate great solutions to our puzzles.” says Nemoto.

Until release, planned for autumn 2013, the team’s main focus is making the core game experience a 100% casual one and integrating it with a tailor-made ranking system. The game will also sport a lightweight narrative background.

The meQuanics development team is truly international. Simon Devitt from Australia and Kae Nemoto from Japan are team leaders with the Quantum Information Science Division at the National Institute of Informatics (NII) in Tokyo, Japan. Game design is led by Klaus Brüggemann from Germany, digital art is by Edern Gray from France and Helmut Prendinger of the Digital Content and Media Sciences Research Division at NII is from Austria. The preview version of meQuanics can be found at www.mequanics.com and feedback can also be communicated to the team through Twitter (@meQuanics) or FaceBook (www.facebook.com/mequanics).

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