IBM demonstrates superconducting quantum computer - Compared to the Quantic SCIO Eductor Software

First: New design detects both types of quantum errors and can be scalable to larger systems

Layout of IBM’s four superconducting quantum bit device. Using a square lattice, IBM is able to detect both types of quantum errors for the first time. The new quantum-bit circuit design allows for independent and simultaneous detection of X and Z errors on two-code qubits, shaded purple and labelled Q1 and Q3. (credit: A.D. Córcoles et al./Nature Communications)

Basics of Quantum Theory and Quantum Electro Dynamics

1. there is packets or quantities of energy thus the name Quantum

2. there is a Indeternancy or Uncertainty Principle so we can never be totaly sure of anything we only know probabilities

3. there is an entwinement or entangelment of particles once joined that means an instant communication at any distance, a Non-Local Action

4. there is an observer effect where the mind of the observer can effect the system he is observing
In 1996 the Eclosion corporation developed a quantum computer software. (more on this later) Today in 2014 IBM scientists Wednesday April 29 unveiled two critical advances towards creating a practical hardware quantum computer by detecting and measuring both kinds of quantum errors simultaneously. They also demonstrated a new, square quantum bit circuit design that they suggest is the only physical architecture that could successfully scale to larger dimensions.

Quantum computers promise to open up new capabilities in the fields of optimization and simulation that are not possible using today’s computers. If a quantum computer could be built with just 50 quantum bits (qubits), no combination of today’s TOP500 supercomputers could successfully outperform it, the scientists say.

The IBM breakthroughs, described in an open-access paper in the April 29 issue of the journal *Nature Communications*, show for the first time the ability to detect and measure the two types of quantum errors (bit-flip and phase-flip) that will occur in any real quantum computer*. Until now, it was only possible to address one type of quantum error or the other, but never both at the same time. This is a necessary step toward quantum error correction, which is a critical requirement for building a practical and reliable large-scale quantum computer.

IBM’s quantum bit circuit is based on a square lattice of four superconducting qubits on a chip roughly one-quarter-inch square. It enables both types of quantum errors to be detected at the same time. Using a square-shaped design instead of the conventional linear array allow for detecting both kinds of quantum errors simultaneously and may offer the best potential to scale by adding more qubits to arrive at a working quantum system.

*Dealing with decoherence*

One of the great challenges for scientists seeking to harness the power of quantum computing is controlling or removing quantum decoherence — the creation of errors in calculations caused by
interference from factors such as heat, electromagnetic radiation, evil intent influences and material defects. The errors are especially acute in quantum machines, since quantum information is so fragile.

Previous quantum-computing research, such as work in the John Martinis Lab at UC Santa Barbara (see “A quantum device that detects and corrects its own errors”), has been able to detect bit-flip or phase-flip quantum errors, but never the two together.

“This provided incomplete information on the quantum state of a system, making the designs inadequate for a quantum computer,” said Jay Gambetta, a manager in the IBM Quantum Computing Group. “Our four qubit results take us past this hurdle by detecting both types of quantum errors and can be scalable to larger systems, as the qubits are arranged in a square lattice as opposed to a linear array.”

Preserving information longer

Quantum information is very fragile because all existing qubit technologies lose their information when interacting with matter and electromagnetic radiation. Theorists have found ways to preserve the information much longer by spreading information across many physical qubits.

“Surface code” is the technical name for a specific error correction scheme which spreads quantum information across many qubits. It allows for only nearest neighbor interactions to encode one logical qubit, making it sufficiently stable to perform error-free operations.

With exponentially more power than today’s fastest supercomputers, quantum computers could herald a new era of innovation across industries (credit: IBM)

The IBM Research team used a variety of techniques to measure the states of two independent syndrome (measurement) qubits. Each reveals one aspect of the quantum information stored on two other qubits (called code, or data qubits). Specifically, one syndrome qubit revealed whether a bit-flip error occurred to either of the code qubits, while the other syndrome qubit revealed whether a phase-flip error occurred.

Determining the joint quantum information in the code qubits is an essential step for quantum error correction because directly measuring the code qubits destroys the information contained within them.

Because these qubits can be designed and manufactured using standard silicon fabrication techniques, IBM anticipates that once a handful of superconducting qubits can be manufactured reliably and
repeatedly, and controlled with low error rates, there will be no fundamental obstacle to demonstrating error correction in larger lattices of qubits.

Quantum computing could allow scientists to design new materials and drug compounds without expensive trial and error experiments in the lab, potentially speeding up the rate and pace of innovation across many industries. Quantum computers could also quickly sort and curate ever larger databases as well as massive stores of diverse, unstructured data. This could transform how people make decisions and how researchers across industries make critical discoveries.

The work at IBM was funded in part by the IARPA (Intelligence Advanced Research Projects Activity) multi-qubit-coherent-operations program.

* Two types of errors can occur on such a superposition state. One is called a bit-flip error, which simply flips a 0 to a 1 and vice versa. This is similar to classical bit-flip errors and previous work has showed how to detect these errors on qubits. However, this is not sufficient for quantum error correction because phase-flip errors can also be present, which flip the sign of the phase relationship between 0 and 1 in a superposition state. Both types of errors must be detected in order for quantum error correction to function properly.

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**Abstract of Demonstration of a quantum error detection code using a square lattice of four superconducting qubits**

The ability to detect and deal with errors when manipulating quantum systems is a fundamental requirement for fault-tolerant quantum computing. Unlike classical bits that are subject to only digital bit-flip errors, quantum bits are susceptible to a much larger spectrum of errors, for which any complete quantum error-correcting code must account. Whilst classical bit-flip detection can be realized via a linear array of qubits, a general fault-tolerant quantum error-correcting code requires extending into a higher-dimensional lattice. Here we present a quantum error detection protocol on a two-by-two planar lattice of superconducting qubits. The protocol detects an arbitrary quantum error on an encoded two-qubit entangled state via quantum non-demolition parity measurements on another pair of error syndrome qubits. This result represents a building block towards larger lattices amenable to fault-tolerant quantum error correction architectures such as the surface code.

[https://www.youtube.com/watch?v=z78QqXYWkpc](https://www.youtube.com/watch?v=z78QqXYWkpc)  Quantum Computers the first Quantum software computer the QXCI
Why quantum computation?

The history of computer technology has involved a sequence of changes from one type of physical realisation to another – from gears to relays to valves to transistors to integrated circuits ... and so on. Today’s advanced lithographic techniques can create chips with features only a fraction of a micron wide. Soon they will yield even smaller parts and inevitably reach a point where logic gates are so small that they are made out of only a handful of atoms.

On the atomic scale matter obeys the rules of quantum mechanics, which are quite different from the classical rules that determine the properties of conventional logic gates. So if computers are to become smaller in the future, new, quantum technology must replace or supplement what we have now. The point is, however, that quantum technology can offer much more than cramming more and more bits onto silicon and multiplying the clock-speed of microprocessors. It can support an entirely new kind of computation with qualitatively new algorithms based on quantum principles!
What are qubits?

From a physical point of view a bit is a physical system which can be prepared in one of the two different states representing two logical values: no or yes, false or true, or simply 0 or 1.

Classical Bit | Quantum Bit
---|---
0 or 1 | 0 or 1 or \[01\]

Quantum bits, called qubits, are implemented using quantum mechanical two state systems; these are not confined to their two basic states but can also exist in superpositions; effectively this means that the qubit is both in state 0 and state 1.

Any classical register composed of three bits can store in a given moment of time only one out of eight different numbers. A quantum register composed of three qubits can store in a given moment of time all eight numbers in a quantum superposition.

Classical register | Quantum register
---|---
101 | 000 001 010 011 100 101 110 111

Once the register is prepared in a superposition of different numbers one can perform operations on all of them.

Thus quantum computers can perform many different calculations in parallel: a system with \(N\) qubits can perform \(2^N\) calculations at once! This has an impact on the execution time and memory required in the process of computation and determines the efficiency of algorithms.
How powerful are quantum computers?

For an algorithm to be efficient, the time it takes to execute the algorithm must increase no faster than a polynomial function of the size of the input. Think about the input size as the total number of bits needed to specify the input to the problem — for example, the number of bits needed to encode the number we want to factorize. If the best algorithm we know for a particular problem has the execution time (viewed as a function of the size of the input) bounded by a polynomial then we say that the problem belongs to class P.

Problems outside class P are known as hard problems. Thus we say, for example, that multiplication is in P whereas factorization is not in P. “Hard” in this case does not mean “impossible to solve” or “non-computable.” It means that the physical resources needed to factor a large number scale up such that, for all practical purposes, it can be regarded as intractable. However, some quantum algorithms can turn hard mathematical problems into easy ones — factoring being the most striking example so far.

The difficulty of factorisation underpins the security of what are currently the most trusted methods of public key encryption, in particular of the RSA (Rivest, Shamir and Adelman) system, which is often used to protect electronic bank accounts. Once a quantum factorisation engine (a special-purpose quantum computer for factorising large numbers) is built, all such cryptographic systems will become insecure.

Potential use of quantum factoring for code-breaking purposes has raised the obvious suggestion of building a quantum computer.
How to build quantum computers?

In principle we know how to build a quantum computer; we start with simple quantum logic gates and connect them up into quantum networks. A quantum logic gate, like a classical gate, is a very simple computing device that performs one elementary quantum operation, usually on two qubits, in a given time. Of course, quantum logic gates differ from their classical counterparts in that they can create, and perform operations, on quantum superpositions.

Can we build quantum computers?

As the number of quantum gates in a network increases, we quickly run into some serious practical problems. The more interacting qubits are involved, the harder it tends to be to engineer the interaction that would display the quantum properties. The more components there are, the more likely it is that quantum information will spread outside the quantum computer and be lost into the environment, thus spoiling the computation. This process is called decoherence. Thus our task is to engineer sub-microscopic systems in which qubits affect each other but not the environment.
What are the most promising technologies?

It is not clear which technology will support quantum computation in future. Today simple quantum logic gates involving two qubits are being realised in laboratories. Current experiments range from trapped ions...

...via atoms in an array of potential wells created by a pattern of crossed laser beams...

...to electrons in semiconductors.

The next decade should bring control over several qubits and, without any doubt, we shall already begin to benefit from our new way of harnessing nature.
The US Navy built a Quantum Computer Submarine but it would not fire a missile

QUANTUM THEORY

1. EVERYTHING HAPPENS IN SMALL QUANTITIES
2. THERE IS AN UNCERTAINTY IN THESE ACTION
3. EVERY ELECTRON CHANGE MAKES A PHOTON CHANGE AND VICE VERSA
4. TIME & SPACE ARE RELATIVE
5. OUR MINDS CAN EFFECT A QUANTUM STATE

SCIENTISTS DISCOVER THAT THEIR MINDS CAN INFLUENCE A QUANTUM EXPERIMENT IN 1987 DR. NELSON WRITES THE FIRST BOOK ON SUBSPACE THEORY
In the macro world we live in and observe with our senses the laws of thermodynamics seems to rule and explain actions. But as we developed more and more scientific analysis of the small we found that there is a different set of rules now known as Quantum Electro Dynamics.

The basic way to know whether a situation needs thermodynamic analysis or QED analysis comes from Plank’s constant in the next equation. All quantum things are uncertain + fall under probability theory.

\[ \Delta x \Delta p \geq \frac{\hbar}{2} = 3.3 \times 10^{-27} \text{ erg/sec} \]

Plank’s constant is \( h = 1.54 \times 10^{34} \). The distance of cleft one angstrom or \( 10^{-8} \) cm

Mass X Velocity X Position

or in this case \( 2 \times 10^{-33} \)

the Synapse is under Quantic Laws not Newtons

When we put the mathematics of the synaptic cleft into the equation we find that the snapse is quantic in action not thermodynamic. Thus there is quantum uncertainty, entwinement, nonlocality + observer effects. Computers work in thermodynamic binary terms (0,1 - on or off). The brain works as a quantum computer and is trinary in action (0,1, Maybe). A computer can be made to work with a trinary logic software if we meet a few quantic criteria. (uncertainty, entwinement, nonlocality + observer effects)

To make a quantum system we need to add the third Maybe category to the decision process. This can be done with a truly random choice. Sheldrake wrote that this explains the chinese I Ching or tarot cards. The I Ching has 64 randoms coins, the tarot 78. But computers do NOT make random numbers.
So if the momentum (mass $X$ velocity) and the distance of target is greater or equal to one half planck’s constant then the system is Thermodynamic

$$\Delta x \Delta p \geq \frac{\hbar}{2} = 3.3 \times 10^{-27} \text{ erg/sec}$$

**Laws of Thermodynamics**

- there is a thing called heat
- energy cannot be created or destroyed and heat energy must be conserved
- heat must pass from a hot body to a cold body thru entropy
- the entropy of a crystal at 0 Kelvin approaches zero

**Quantum Guidelines (not Laws)**

- there is energy and it can be expressed as matter, light, fields, all intertwined and connected with subspace collective unconsciousness
- virtual energy can be made out of apparent nothing and return
- heat or energy can be conserved in a quantic process and resist entropy
- the mind of a quantic process can effect another quantic process
- all is probability

**Thermodynamic computers**

- are on - off or Binary

**Quantum Computers**

- are on-off-maybe or Trinary

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4. there is an observer effect where the mind of the observer can effect the system he is observing
It's known that in a computer, random numbers are basically generated from a function which is fed a 'seed number', which would be something such as the time, or any other number. The function would then create a series of numbers which would be distributed over a certain range, enough to give the appearance of being random. In other words, the numbers generated were statistically spread out so that they would serve our purpose. In reality, though, they were the result of an equation, and if that same seed were supplied to the same function again, we'd get the exact same numbers generated. So that didn't really make it random, did it?
We tried a gumbel formula variation, but we finally found a new mathematical increment that would be able to make a true real random number and make a true quantic event to work the *Maybe*.

\[
\text{Probability Density Function} = \frac{z e^{-z}}{\beta} \\
\text{Where } z = e^{-\frac{x - \mu}{\beta}} \\
\mu = \text{Location} \\
\beta = \text{Scale}
\]

So since it is vital we get a real actual RANDOM number as a true quantic event and computers random function does NOT do this, it was first key to develop the right process to get a true random number that would be capable of entwinement with our patient. We used an increment with a Sheldrake Morphic Resonance Algorithm Alignment with an Einstein-Rosen Bridge Connectivity to solve the problem.

We should point out at this time that the sole purpose of developing this quantic computer software was for medicine. We developed a biofeedback device to measure and treat the body electric, and then quantic software was developed to improve data. But with the principle of entwinement being so entwined it became apparent that a spooky distance process would allow us to measure a patient at a distance.

Radionics had used such principles, and the quantic event in radionics was supplied by a person. A person would use a dousing stick, wipe board, Ouija board, point probe, or muscle test and the tester would supply the quantic indeterminacy. But this so-called indeterminacy was influenced by expectation, greed, and human emotion and the radionics became illegal and not scientifically verifiable. In other words they failed all double blind testing.


The computer with our original random increment process was successful. And to further protect it from receiving harmful quantic influence we made a Tibetan prayer wheel computer program to play millions of times a second with the increment. The Tibetans found that an inanimate object could pray. We now had a way to get the computer to do the same.

Sheldrake said that the I Ching had 64 random events, and the human has 10 to the 15th synapses, so what if we could make a device that would generate 10 to the 15th random events to match the human brain indeterminacy. Then we could make a consciousness system. So we at first called it the *QXCI* (Quantum Xrroid Consciousness Interface). First developed in 1996 and registered for legal medical sale. In 1989 we FDA registered the EPFX (Electro-Physiological-Feedback-Xrroid). This was a biofeedback system that used a test kit to measure elector-physiological reaction (EPR) of a patient to a substance. (See patents) so Xrroid became a FDA registered name and term.
The word \textit{Xrroid} was coined to describe a rapid reaction testing of many nutrients and or toxins.

\textbf{Desire' Dubounet Patents}

- Irish Patent #1995/0437. Grant# S67328 “Apparatus and method for detecting the reaction of a subject to a plurality of substances.”
- Irish Patent #1994/0226. Grant# S0784 a homeopathic medicine
- Irish Patent #1994/0084. Grant# S64987 a method for testing a homeopathic pharmaceutical
- Irish Patent #1993/0215. Grant# S58223 a homeopathic medicine.

So with a copyrighted mathematical increment for the quantic randomness matching the 10 to the 15th events and stabilized by a prayer wheel the subspace system was ready to go and over 35,000 systems have been sold worldwide all legally registered for medical sale. The Eclosion corp developed the first real quantum software computer in 1996. Watch this to understand more \url{http://www.youtube.com/watch?v=PWEOBqhQuQE}

By tapping into the Quantum Entanglement and Entwinement of the space time fabric of the universe I developed a Sheldrake Morphic Resonance Algorithm alignment with an Einstein-Rosen Bridge Connectivity to make a true subspace quantum computer. To stabilize it from negativity and to protect therapists and patients from Karmic leakage I developed a Tibetan Prayer Wheel Modulation SuperImposition. 1996 the subspace interactive system was born. A new type of biofeedback and a revolution in medicine.

\textbf{Quantum Biofeedback is}

1. The most published and researched Energetic Medical Technology in history
2. Scientifically validated and legally registered
3. Taught in Medical Universities
4. Natural Medicine with a High Tech edge
5. Biofeedback is paid for by Medicare, Medicaid and many Major Insurance Companies

\hspace*{1cm} \textit{(Desire’ Dubounet )}
The Person behind this Revolution in Medicine

The person behind this revolution is one of the most wrongfully persecuted people in the world. Drug companies, fraudulent competitors, unprofessional journalists and rogue Regulators have attacked this Great Spirit. Einstein once said “Great Spirits get incredible resistance from Mediocre Minds”. Well God must have loved mediocre minds, because he made so many of them! And the smaller the mind the more they love to attack Professor of Medicine Desire’ Dubounet! As you will investigate the videos and many books of her science you will see a new form of medicine: more rational and more healing than the current controlled form from the greedy drug companies.

Desire’ and her friends have spent over 35 million dollars to create a medical study program for IMUNE. An entertaining thorough course filled with information and wisdom of all medicine based subjects in natural, energetic and mental powers, and in compassion, yogic and spiritual ways of healing and truly seeing all of modern medicine.

This study program is not for free. But, Professor Desire’ Duboumet does allow you to pay for viewing and to use the material with Karma in those cases where currency is lacking. This is a beautiful and very gracious example of philanthropic caring, a graceful gesture for a troubled world. With intellect and compassion and an enlightened soul Desire’ has created hundreds of hours of training videos on all aspects of health care.

WHAT WILL HAPPEN WHEN QUANTUM COMPUTER HARDWARE MEETS QUANTUM CONSCIOUSNESS SOFTWARE, WELL TIME WILL TELL.

references:


related:

- IBM Scientists Achieve Critical Steps to Building First Practical Quantum Computer