News

Towards faster, more efficient quantum computers

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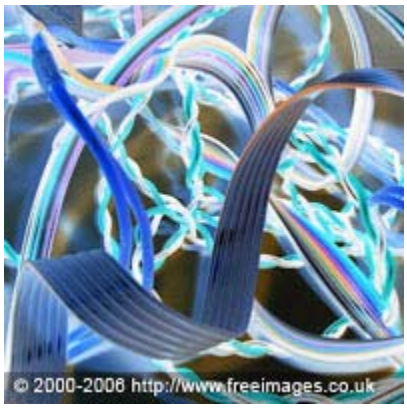

Quantum computers just got faster and more efficient, thanks to new research from the EU-funded Qubit Applications (QAP) project. The findings are published in the latest edition of the journal Nature.

'Usually in quantum computing you start the machine and let it work and don't disturb it, because disturbing it could disturb the calculation,' said Professor Anton Zeilinger of the University of Vienna, adding that because of the intrinsic randomness of quantum mechanics, the machine does not always get the right results.

Now Professor Zeilinger and his team have developed a 'one-way quantum computer', in which the very act of observing the qubits (quantum bits) drives the calculation. In the experiment, the researchers created a so called entangled state, in which many qubits are connected to one another.

'When you observe one, you change all the others as well. This means that if you change one the right way and another one the right way you drive the system towards the calculation,' explained Prof. Zeilinger. In other words, 'you change the future measurements by feeding forward the measurement results.'

Using this system, Professor Zeilinger and his team managed to perform a calculation in record time - just 150 nanoseconds. Their findings have major implications for quantum computing.

'The one-way quantum computer exploits the counterintuitive features of quantum mechanics to the fullest,' commented Professor Zeilinger, referring to the use of entanglement and the randomness of the quantum world. 'This opens up a completely new avenue, different from all others.'

For more information about the QAP Project, please visit:
http://www.qubitapplications.com/

To read the research findings in Nature, please visit:
http://www.nature.com/nature

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