**Google's Quantum Computing**

Quantum computing continues to grow, and with the recent announcement by the American quantum computing company D-Wave, the 2000-qubit processor, it shows no signs of delays. Google is the first quantum computing company that has made the technology available for commercial use. The quantum computing processors are in direct competition with the more traditional chip types used for machine learning and AI GPUs, as well as for the recently announced second-generation TPU from Google.

The most critical thing in quantum computing is replacing the traditional conception of computer use. By replacing the conventional bit 0 or 1 with a new type of information, it opens exponential possibilities. The qubit can be in the state of superposition, where for the time being it is neither +1 nor -1, in a way it is both and that is what makes the ultrafast computation possible.

This is where we are lucky. This specific class of quantum computing is useful for a subset of computer optimization problems, especially those focused on machine learning. Many machine learning problems can be reformulated into energy problems. D-Wave quantum computers are designed to address issues that require high-level reasoning followed by decision-making. With Quantum computing, artificial intelligence systems can mimic the processes of human thinking much more closely than a conventional processor. And while the idea of ​​quantum computing may be difficult to understand, its use in Machine Learning opens new perspectives.

In the upcoming battle between GPUs and TPUs, it is possible that quantum computing will enter the outer path. One of the main elements of D-Wave's quantum computing is that it is not necessarily designed to solve all problems, but that it meets the same need in the processing market that graphics processors currently fulfill. Google has published an article in which they discovered that the use of the D-Wave quantum computer on a conventional processor yielded a considerable computer advantage. In many ways, a quantum computer can do the same as a GPU, but faster and nowadays time is money.

Google wants to help change that. A software toolkit with which developers can create algorithms without knowledge of quantum physics. Cirq is an open source initiative, which means that everyone has access to the software and can change it. Google compares it with its popular open source toolbox TensorFlow, which has facilitated the development of software for computer learning. For the time being, developers can use Cirq to create quantum algorithms that are run on simulators. But the goal is to make software that will work on a large number of real machines in the future.