
Media information

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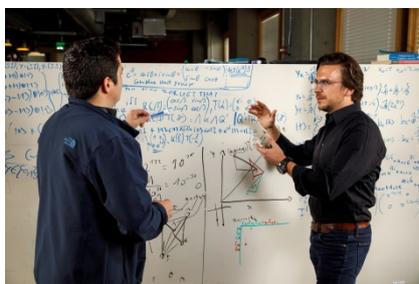
Volkswagen tests quantum computing in battery research

- Volkswagen experts want to simulate the chemical structure of batteries on quantum computers
- They have already successfully modeled key molecules such as lithium-hydrogen and carbon chains on quantum computers
- The objective is the “tailor-made battery”, a configurable chemical blueprint ready for production
- Volkswagen is presenting quantum computing at CEBIT (June 12-15)

Wolfsburg/Hanover, June 7, 2018. For the first time, Volkswagen experts have succeeded in simulating industrially relevant molecules using a quantum computer. This is especially important for the development of high-performance electric vehicle batteries. The experts have successfully simulated molecules such as lithium-hydrogen and carbon chains. Now they are working on more complex chemical compounds. In the long term, they want to simulate the chemical structure of a complete electric vehicle battery on a quantum computer. Their objective is to develop a “tailor-made battery”, a configurable chemical blueprint that is ready for production. Volkswagen is presenting its research work connected with quantum computing at the CEBIT technology show (Hanover, June 12-15).



Volkswagen experts want to simulate the chemistry of vehicle batteries on a quantum computer.



Volkswagen CODE Lab in San Francisco: experts are pushing ahead with the development of quantum algorithms here.

Martin Hofmann, CIO of the Volkswagen Group, says: "We are focusing on the modernization of IT systems throughout the Group. The objective is to intensify the digitalization of work processes – to make them simpler, more secure and more efficient and to support new business models. This is why we are combining our core task with the introduction of specific key technologies for

Volkswagen. These include the Internet of Things and artificial intelligence, as well as quantum computing."

The objective is a "tailor-made battery", a configurable blueprint

Using newly developed algorithms, the Volkswagen experts have laid the foundation for simulating and optimizing the chemical structure of high-performance electric vehicle batteries on a quantum computer. In the long term, such a quantum algorithm could simulate the chemical composition of a battery on the basis of different criteria such as weight reduction, maximum power density or cell assembly and provide a design which could be used directly for production. This would significantly accelerate the battery development process, which has been time-consuming and resource-intensive to date.

Florian Neukart, Principle Scientist at Volkswagen's CODE Lab in San Francisco, says: "We are working hard to develop the potential of quantum computers for Volkswagen. The simulation of electrochemical materials is an important project in this context. In this field, we are performing genuine pioneering work. We are convinced that commercially available quantum computers will open up previously unimaginable opportunities. We intend to acquire the specialist knowledge we need for this purpose now."

On this project for the simulation of electrochemical materials, IT is co-operating closely with Volkswagen Group Research. The Volkswagen experts have already successfully simulated key molecules such as lithium-hydrogen and carbon chains, on a quantum computer. They are now working on more complex chemical compounds. In the experts' opinion, they are only at the beginning of their development work.

Volkswagen and quantum computing

Highly specialized IT experts from Volkswagen, including data scientists, computer linguists and software engineers, are working together at the IT labs in San Francisco and Munich to develop the potential of quantum computers for applications which will be beneficial for the company. The main focus is on the programming of algorithms on quantum computers. These are subject to different laws than in the case of conventional computers.

In the field of quantum computing, the Volkswagen Group is cooperating with the technology partners Google and D-Wave, who provide the Volkswagen experts with access to their systems.

Note: This text and images are available at www.volkswagen-media-services.com.



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