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## Digital pioneering work: Volkswagen uses quantum computers

- Cooperation with leading quantum computing company D-Wave Systems
- World premiere at CeBIT: research project for traffic flow optimization

**Wolfsburg, March 13, 2017 – The Volkswagen Group is the world’s first automaker to use quantum computers, further expanding its digital competence for the future. In this context, Volkswagen Group IT is cooperating successfully with leading quantum computing company D-Wave Systems on a research project for traffic flow optimization. In the course of this project, IT experts from the Volkswagen labs in San Francisco and Munich have been the first to develop a smart mobility program on the D-Wave quantum computer. Quantum computers can solve highly complex problems many times faster than conventional supercomputers. To date, quantum computing technology has been used primarily by scientific institutes, government agencies, and in the aerospace sector.**

At CeBIT 2017 in Hanover, Volkswagen and D-Wave will be announcing their strategic cooperation and, as a world premiere, demonstrating a software program that optimizes traffic flow on a quantum computer. In the course of this project, experts from the Volkswagen Code Lab in San Francisco and the Volkswagen Data Lab in Munich and used data from approximately 10,000 taxis in Beijing.

Dr. Martin Hofmann, CIO of the Volkswagen Group, says: “We are doing digital pioneering work. Quantum computing technology can bring tremendous progress to Volkswagen with respect to all the key IT topics of the future. We are now laying the foundation for the future by learning to make effective use of the strengths of a quantum computer. Our cooperation with D-Wave is a milestone on the way to the digital future of our Group. This shows that there is no other company where IT is now as exciting as at Volkswagen.”

Robert “Bo” Ewald, President of D-Wave International, says: “The goal of our cooperation with Volkswagen is to apply our quantum computing technology to Volkswagen’s real-world computing challenges and make a positive impact on their business. Bringing together our quantum computing experts with their automotive AI experts is the perfect model to make significant progress toward that goal. This project is a great example of how computing in the future will be done, with talented people looking at new ways to solve old problems, and combining traditional computers with quantum computers to deliver an improved solution.”

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The strategic cooperation between the two companies focuses on the joint use of quantum computing systems. Experts from the Volkswagen Group IT labs are testing the programming of applications and algorithms on D-Wave's quantum computer. This will result in the development of specialist expertise at Volkswagen and on the identification of meaningful applications that would benefit from the application of quantum computing within the Group.

The first research project is traffic flow optimization in the Chinese mega-metropolis of Beijing. Data scientists and AI specialists from Volkswagen have successfully programmed an algorithm to optimize the travel time of all public taxis in the city. The computing principle of a quantum computer is especially well-suited for this project because it natively solves optimization problems.

In simplified terms, an optimization problem considers how a specific resource (such as time, money or energy) can be used in the best possible way in a certain scenario. The complexity of the task and therefore the computing capacity required grow exponentially with the number of factors to be considered, taking conventional digital computers to their limits.

The Volkswagen Group is the first automaker to work intensively with quantum computing technology. Group IT expects a wide range of application possibilities especially in the areas of autonomous driving, the robotic enterprise (AI-supported process control), the smart factory, machine learning and intelligent mobility solutions.

Further projects with D-Wave are to follow. Initially, the main focus is on the acquisition of specialist knowledge. The IT experts are testing applications and algorithms to make the best possible use of the tremendous computing potential of D-Wave's quantum computer. In addition, the Volkswagen Group plans to intensify cooperation with universities and scientific institutes in the field of quantum computing.

## **Note for editors: At CeBIT 2017 – official announcement of cooperation and showcase on current research project**

The cooperation between the Volkswagen Group and D-Wave Systems is to be officially announced at CeBIT 2017: Monday, March 20, 2017, starting at: 1:30 p.m CET, Volkswagen booth in Hall 11.

**Note:** This text and related images are available at [www.volkswagen-media-services.com](http://www.volkswagen-media-services.com)

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## About D-Wave:

D-Wave is the leader in the development and delivery of quantum computing systems and software, and the world's only commercial supplier of quantum computers. Our mission is to unlock the power of quantum computing for the world. We believe that quantum computing will enable solutions to the most challenging national defense, scientific, technical, and commercial problems.. D-Wave's systems are being used by some of the world's most advanced organizations, including Lockheed Martin, Google, NASA Ames, USRA, USC, and Los Alamos National Laboratory. With headquarters near Vancouver, Canada, D-Wave's U.S. operations are based in Palo Alto, CA and Hanover, MD. D-Wave has a blue-chip investor base including Goldman Sachs, Bezos Expeditions, DFJ, In-Q-Tel, BDC Capital, Growthworks, Harris & Harris Group, International Investment and Underwriting, and Kensington Partners Limited. For more information, visit: [www.dwavesys.com](http://www.dwavesys.com).

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