Tomasz Stopa, IBM Software Lab in Kraków, Poland
Katarzyna Rycerz, Department of Computer Science, AGH University

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Tomasz Stopa**: IBM's quantum computing roadmap to applications**

Universal quantum computer was a holy grail for the last 40 years. However, researchers and scientists accelerate the efforts and believe, that next decade will bring devices and associated software stack allowing to apply quantum computers to problems intractable with classical supercomputers.

In the lecture, IBM's roadmap towards quantum computing applications will be presented. Co-design approach with hardware and software going together hand in hand will be a critical element of the game.

Bio:
Tomasz Stopa works in IBM Software Lab in Kraków, Poland.
He obtained Ph.D. in theoretical solid state physics from AGH University of Science and Technology.
IBM Master Inventor with 35 patents and scientific publications.
As IBM Quantum Ambassador promotes IBM technologies within industry, academia and high schools.
Co-organizer of Kraków Quantum Computing Seminar (KQIS).

Katarzyna Rycerz**: EuroHPC challenge of scheduling Workflows with near-term quantum devices**

The subject of this talk focuses on one of the important challenges in the EuroHPC PL project (https://www.eurohpc.pl/): exploring the possibility of solving a popular optimization problem, workflow scheduling, using quantum computers. In the model of scientific computations, called scientific workflow, computations are expressed as a graph of many (often thousands) computational tasks, which must be performed in a strictly defined order. Many important computational problems in the field of astronomy, bioinformatics, high energy physics or computational medicine can be expressed in that way.

In this talk, we will present an approach using D-Wave quantum annealer as well as using variational algorithms designed for gate based devices. We will also discuss limitations, the existing solutions and point possible future work.

Bio:

Katarzyna Rycerz received her PhD in computer science from UvA, Amsterdam in 2006. Currently works as assistant professor at the Department of Computer Science AGH, Kraków, Poland and is a co-author of over 50 international publications in the area of distributed computing, environments for multiscale simulations, quantum computing simulation and support for scientific applications. She was involved in the EU ICT projects: CrossGrid (the Architecture Team member), CoreGRID and MAPPER (WP leader). Currently, she is interested in quantum computation, in particular solving HPC and Cloud related problems using existing quantum computers. She is also interested in quantum games.