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Research Success Story

WHEN THE MOST SECURE KEY IS NOT A KEY

Quantum physics offers superior cyber security, for example, via random numbers, impossible to predict or reproduce. Devices called quantum random number generators (QRNG) 'pick' these numbers. The first QRNG was developed in 2001 by the Geneva-based company ID Quantique, now part of the project "QRANGE", aiming to advance this technology. QRANGE is funded under the EU's Flagship on Quantum Technologies.

Random numbers are fundamentally important for basically all cryptographic algorithms. So, it is of the utmost importance that there be not even the slightest doubt about their functioning and resistance to attack. Fortunately, the laws of science offer numbers generated by the intrinsic randomness of quantum physics. Random numbers produced by quantum random number generators (QRNG) are, by their very nature, impossible to predict.

Over the next 3 years, the QRANGE project will push QRNG technology towards a wide range of disruptive commercial applications, as part of the Quantum Flagship, one of the EU's largest and most ambitious research initiatives. Included in the 9-member consortium, coordinated by the University of Geneva, is ID Quantique (IDQ), creator of the first QRNG and still market leader in quantum communication devices.

"QRANGE aims to build 3 different prototypes that are cheaper, faster and more secure than existing devices," explains Dr Florian Fröwis, QRANGE Project Manager at IDQ. "Our deliverable is to look at the prototypes and identify all the possible attacks in the context of the use cases for which the device is being developed."

Participation was a must

"Strategically, it was clear that IDQ and the University of Geneva should be part of QRANGE," explains Fröwis. "QRANGE will help IDQ stay involved in the quantum technology community in Europe, and with all the relevant stakeholders in the industrial and academic sectors. By working with our competitors, we will learn from them and they from us. Finally, being part of the project will help finance R&D and standardisation for our devices, and our work will benefit the whole quantum industry."

"Euresearch gave us good advice on setting our budget ceiling and essential input on the guidelines and main points to be addressed"

Critical feedback

Although the EU website provides all the necessary information for applicants, Fröwis notes that expert help from Euresearch made the difference in drafting a winning proposal for the QRANGE consortium. "Euresearch gave us good advice on setting our budget ceiling and essential input on the guidelines and main points to be addressed, plus they reviewed our draft and gave us extensive feedback."

About QRANGE

"We wanted to be part of QRANGE to stay involved in the quantum community and keep in contact with all the relevant stakeholders."

Dr Florian Fröwis
QRANGE Project Manager, ID Quantique

CONTENT SUMMARY

The intrinsic randomness of quantum physics is the ideal basis for quantum random number generators (QRNG). QRANGE aims to extend existing QRNG technology by building 3 cheaper, faster and more secure prototypes. QRANGE will also seek to advance the theory of QRNG for next-generation devices, as well as develop a certification framework specially designed for QRNG.

FACTS AND FIGURES

Project Name
QRANGE

Research Area
Quantum Technologies

Organisations
University of Geneva (Coordinator) and 8 partners

Start Date – End Date
01.10.2018 – 30.09.2021

Duration
3 years

Project Cost
€3.2 million

Project Funding
€3.2 million

Programme
Horizon 2020 Excellent Science: Future and Emerging Technologies (FET) Quantum Technologies Flagship

More Information
qrange.eu

Euresearch is an information and advisory service on the European Research and Innovation Framework Programmes. It has offices in all the Swiss regions and a Network Office in Bern. Euresearch is a non-profit association supported by the Swiss federal government.

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