Тема: Квантовая криптография

Ключевые слова: quantum cryptography

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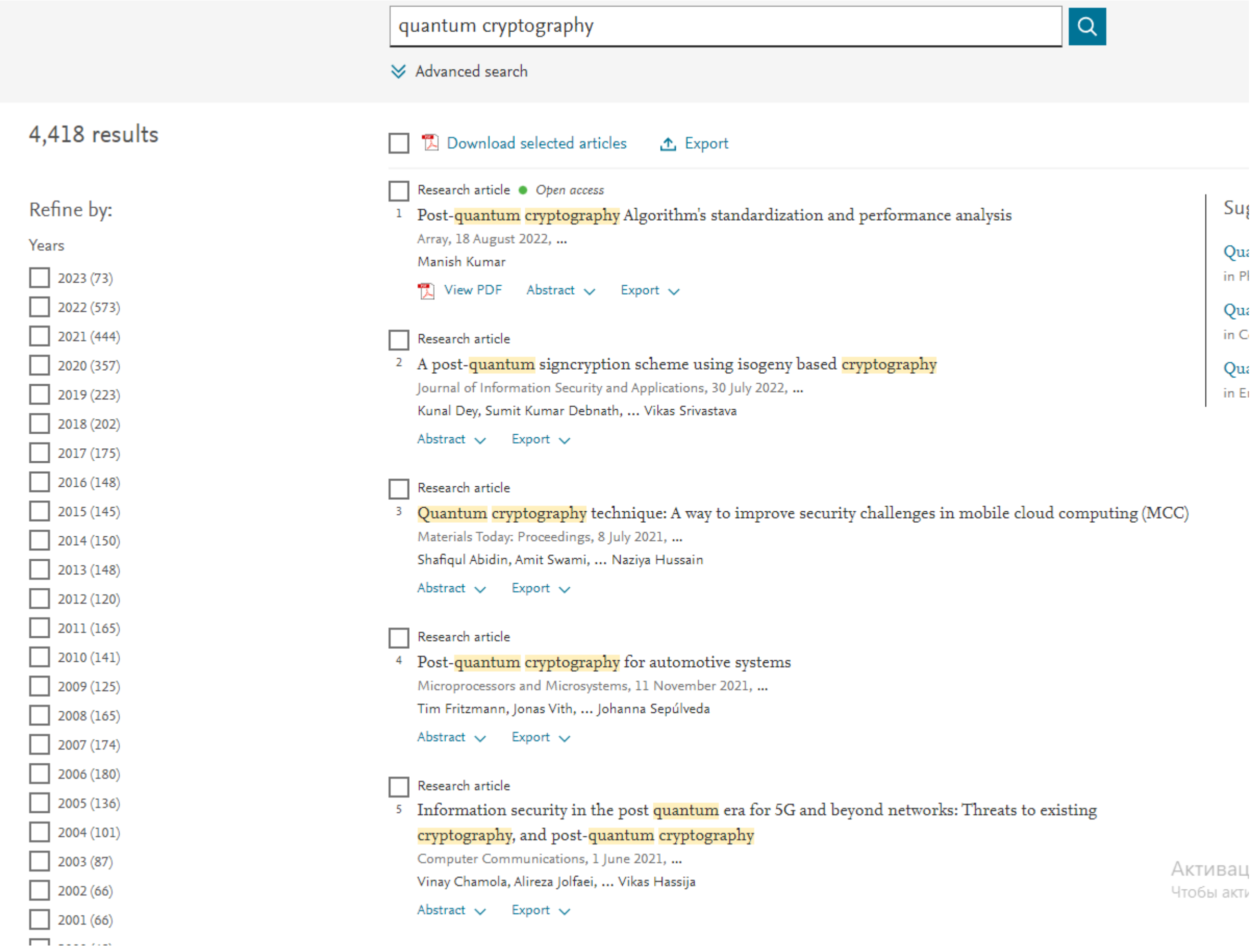

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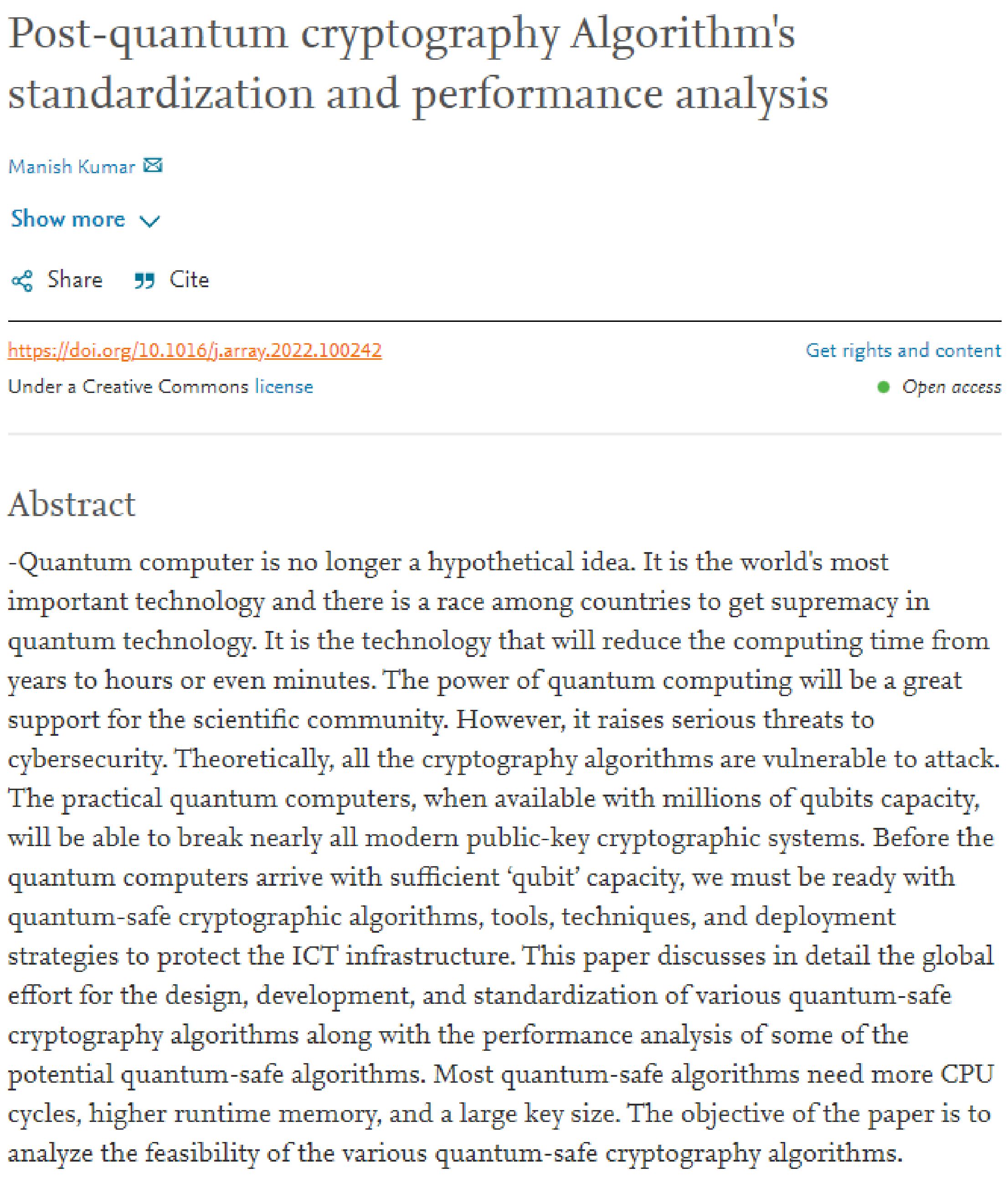


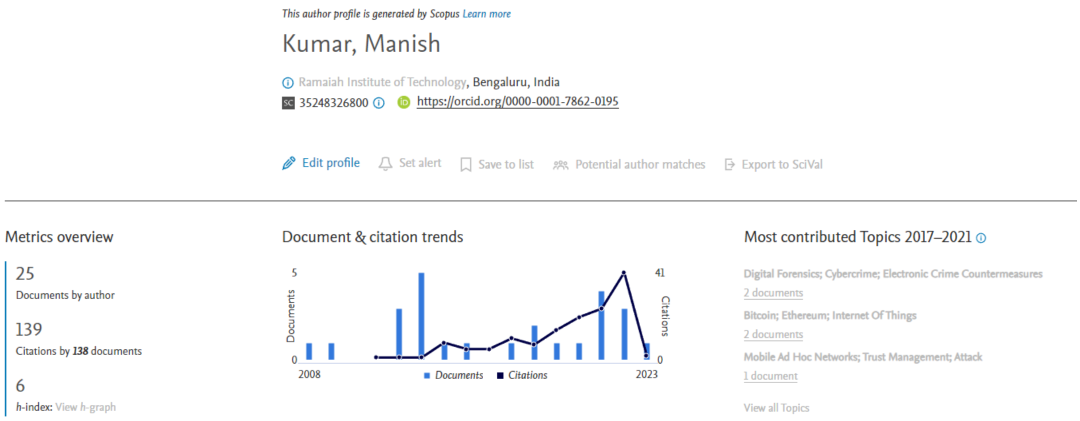
Post-quantum cryptography Algorithm's standardization and performance analysis

Manish Kumar ✉

https://doi.org/10.1016/j.array.2022.100242

Abstract

-Quantum computer is no longer a hypothetical idea. It is the world's most important technology and there is a race among countries to get supremacy in quantum technology. It is the technology that will reduce the computing time from years to hours or even minutes. The power of quantum computing will be a great support for the scientific community. However, it raises serious threats to cybersecurity. Theoretically, all the cryptography algorithms are vulnerable to attack. The practical quantum computers, when available with millions of qubits capacity, will be able to break nearly all modern public-key cryptographic systems. Before the quantum computers arrive with sufficient 'qubit' capacity, we must be ready with quantum-safe cryptographic algorithms, tools, techniques, and deployment strategies to protect the ICT infrastructure. This paper discusses in detail the global effort for the design, development, and standardization of various quantum-safe cryptography algorithms along with the performance analysis of some of the potential quantum-safe algorithms. Most quantum-safe algorithms need more CPU cycles, higher runtime memory, and a large key size. The objective of the paper is to analyze the feasibility of the various quantum-safe cryptography algorithms.



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Alekha Parimal Bhatt 1 ✉, Anand Sharma 1 👤 ✉

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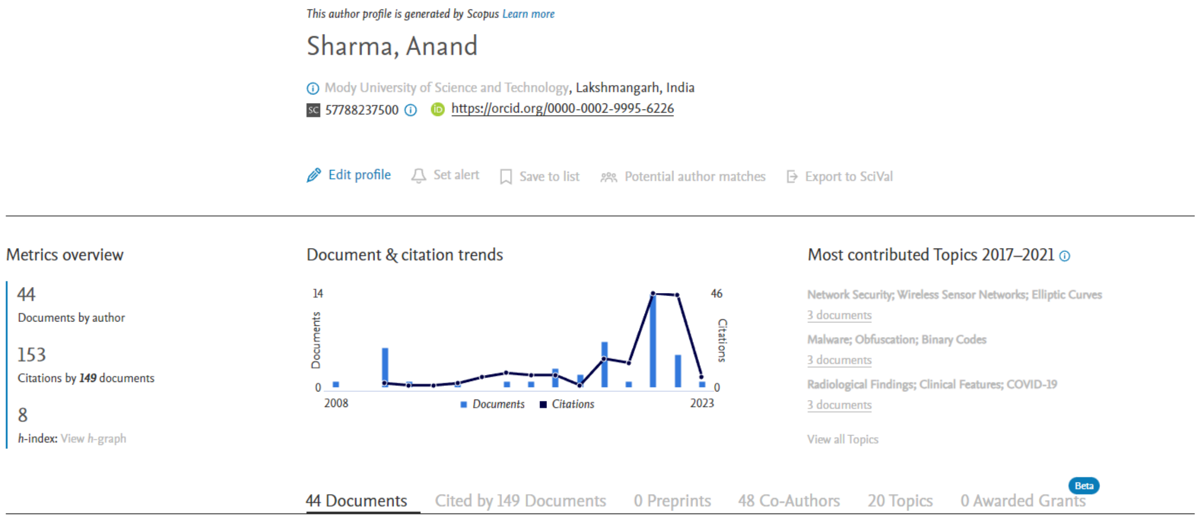
Abstract

Internet of things (IoT) is a developing technology with a lot of scope in the future. It can ease various different tasks for us. On one hand, IoT is useful for us, on the other hand, it has many serious security threats, like data breaches, side-channel attacks, and virus and data authentication. Classical cryptographic algorithms, like the Rivest-Shamir-Adleman (RSA) algorithm, work well under the classical computers. But the technology is slowly shifting towards quantum computing, which has immense processing power and is more than enough to break the current cryptographic algorithms easily. So it is required that we have to design quantum cryptographic algorithms to prevent our systems from security breaches even before quantum computers come in the market for commercial uses. IoT will also be one of the disciplines, which needs to be secured to prevent any malicious activities. In this paper, we review the common security threats in IoT and the presently available solutions with their drawbacks. Then quantum cryptography is introduced with some of its variations. And finally, the analysis has been carried out in terms of the pros and cons of implementing quantum cryptography for IoT security.



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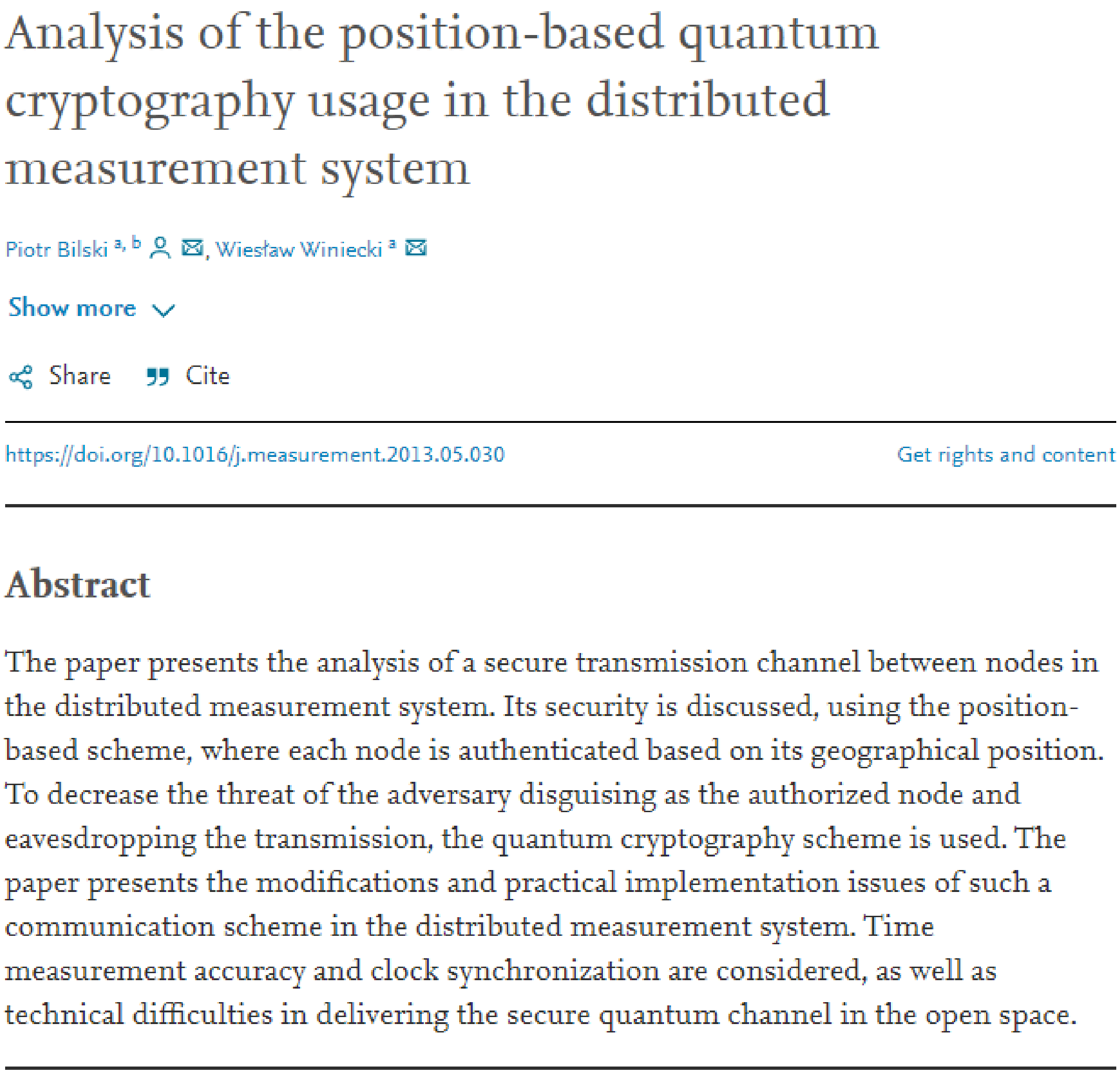


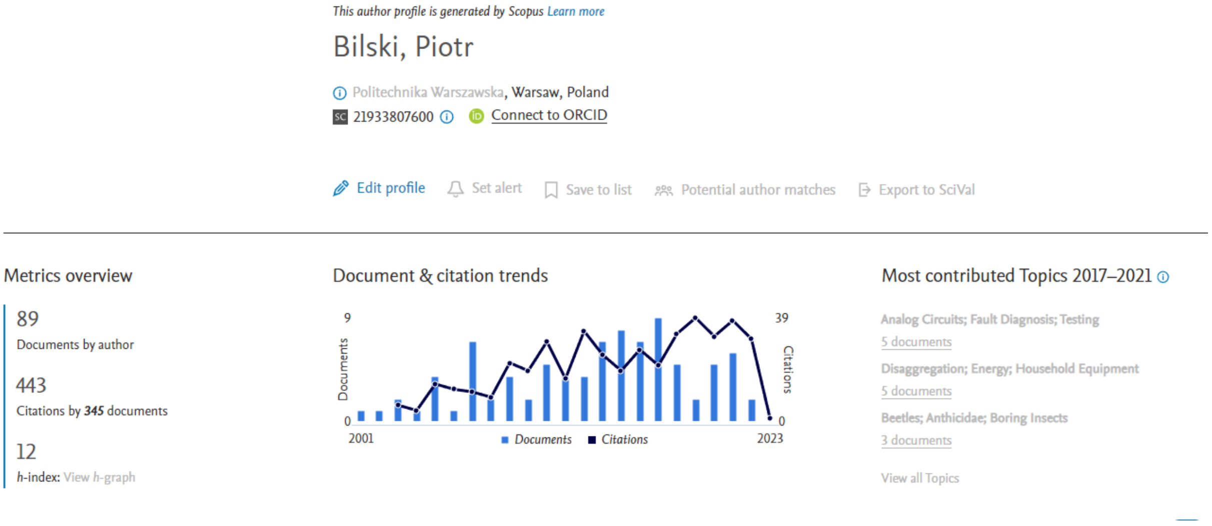
Analysis of the position-based quantum cryptography usage in the distributed measurement system

Piotr Bilski [a], [b], Wiesław Winiecki [a]

https://doi.org/10.1016/j.measurement.2013.05.030

Abstract

The paper presents the analysis of a secure transmission channel between nodes in the distributed measurement system. Its security is discussed, using the position-based scheme, where each node is authenticated based on its geographical position. To decrease the threat of the adversary disguising as the authorized node and eavesdropping the transmission, the quantum cryptography scheme is used. The paper presents the modifications and practical implementation issues of such a communication scheme in the distributed measurement system. Time measurement accuracy and clock synchronization are considered, as well as technical difficulties in delivering the secure quantum channel in the open space.



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Вывод

Проанализировав поиск англоязычных и русскоязычных статей на тему, квантовая криптография можно сделать вывод что англоязычных статей больше. Видно, что данная тема начала своё развитее с 1999 года и стремительно развивается до сих пор, большее количество статей вышло в 2022 году.