

TALK INFO

Presenter: **Jakub Szefer**, Associate Professor, ECE Dept., Northwestern University

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Title:

Quantum Computer Security in NISQ and FTQC Eras

Abstract:

Quantum computing systems continue to advance rapidly in their size and fidelity. In parallel, there is an increasing number of deployments of these quantum computing systems into cloud-based services for use by researchers and the public: they are becoming available as cloud-based services thanks to IBM Quantum, Amazon Braket, Microsoft Azure, and other cloud providers, as well as they can be accessed from many clouds run directly by the quantum computing vendors. The cloud-based access to quantum computers may make these systems vulnerable to novel security attacks, both for users and the cloud providers. In this context, the talk will introduce the emergent work on security of quantum computing: what are present security threats, what are possible defenses, and how to help develop secure-by-design quantum computers. The talk will explore both security issues in NISQ quantum computers, and the emergent FTQC quantum computers as they are likely to be available in cloud-based deployments soon. This talk is about security attacks (and defenses) for quantum computers, it will not cover post-quantum cryptography.

Short Speaker Bio:



Jakub Szefer is an Associate Professor in the Electrical and Computer Engineering Department at Northwestern University where he leads the Computer Architecture and Security Lab (CASLAB). His research focuses on security attacks and defenses at the computer architecture and hardware levels of computer systems. His work encompasses security of processor architectures, reconfigurable logic, post-quantum cryptographic accelerators, and quantum computers. He is the author of the “Principles of Secure Processor Architecture Design” book, published in 2018, and co-editor of the “Security of FPGA-Accelerated Cloud Computing Environments” book, published in 2023. He received his BS degree with highest-honors in Electrical and Computer Engineering from University of Illinois at Urbana-Champaign, and MA and PhD degrees in Electrical Engineering from Princeton University.