



Spring 2023 Colloquium

Department of Computer and Information Sciences

Technology-Independent Security for Information Systems: Fundamental limits and coding schemes

Dr. Remi Chou

Assistant Professor
School of Computing
Wichita State University

**Thursday, March 23, 2 PM
Room: SERC 306**

Abstract: The design of current security solutions for information systems is attack specific and relies on the assumption that attackers are computationally limited. As a result, security solutions constantly need to be redesigned to keep up with the increasing computational power offered by computers and available to attackers. Worse, such an approach leaves information systems vulnerable to unanticipated attack strategies or the threat of quantum computing attacks. For these reasons, the U.S. Department of Homeland Security has recently called for the development and adoption of post-quantum cryptography solutions to protect critical information systems.

In this talk, we discuss an information-theoretic framework that enables security and privacy guarantees against computationally unbounded attackers and quantum computing attacks. We illustrate the application of this framework to the understanding of fundamental communication trade-offs and the development of communication protocols in three application domains, namely, (i) wireless communication networks, (ii) distributed communication systems, and (iii) quantum communication networks. For each application domain, we discuss case studies and present our current and planned research directions.

Bio: Dr. Remi Chou received the engineering degree from CentraleSupélec, France, in 2011, and the Ph.D. degree from the Georgia Institute of Technology, Atlanta, GA, in 2015. From 2015 to 2017, he was a postdoctoral scholar at the Pennsylvania State University, University Park, PA. He is now an Assistant Professor in the School of Computing at Wichita State University, Wichita, KS. He received an NSF-CISE Research Initiation Initiative (CRII) award in 2019 and an NSF CAREER award in 2021.

