MONTHLY TALKS

CYBER-PHYISICAL SYSTEMS Society of Iran

2022 — SUMMER

Shahrivar. 27 | 16:00 P.M. - 18:00 P.M.

CPSSI Virtual Hall

SPEAKER: Ehsan Aerabi, PhD (Grenoble Institute of Engineering, France)

Employing SIMD to Trade Performance with Hardware Security in Energy Harvested Cyber-Physical Embedded Systems

ABSTRACT: Cyber-physical system", "network-enabled embedded systems" or "IoT devices", are related terms addressing small systems that can communicate over networks and have limited energy and performance, but like any other object connected to the network are prone to security threats. Hardware security is an important aspect of a secure embedded system. Mainly, Side channel analysis and Fault Injections are two main categories of hardware threats against embedded systems. Energy harvesting adds another aspect to these systems: variable energy. Variable energy demands variable performance and security measures that should scale up and down with regard to the amount of the harvested energy. This talk spans the security and performance of network-connected energy-harvested embedded systems and more importantly how to trade them on demand while considering their limited resources. In this talk, we focus on the first generic SIMD-based software countermeasure that can concurrently resist against Side-Channel Analysis (SCA) and Fault Injection (FI).

BIOGRAPHY OF THE SPEAKER: Dr. Ehsan Aerabi is a researcher at the LCIS laboratory at Grenoble-INP, France. His main research interests span embedded systems, cryptography, and real-time systems. Ehsan and his team's research activities at the LCIS were built around a secure medical implant, to which, they provide security on software and hardware levels. Ehsan received a BSc degree from Amirkabir University, an MSc degree from the Isfahan University of Tech, and a Ph.D. degree from Iran University of Science and Technology.

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