



University of Pavia

Ph.D. School of Electrical and Electronics Engineering and Computer Science

SEMINAR

Sensor Security in Cyber-Physical Systems

Dr. Sara Rampazzi

University of Michigan (USA)

Electrical Engineering and Computer Science, CSE Division

15 June 2018, h 11:00÷13:00

Seminar Room, floor D, old Informatics Dept.

Abstract: In cyber-physical systems, the advent of the Internet-of-Everything revolution has opened the doors to security vulnerabilities never considered before. New threats affect device sensors at both the analog and physical property layers. Examples of attacks include: sound waves, which can crash drones by affecting gyroscopic sensors; jamming attacks, which may prevent automated driving system from detecting objects; and electromagnetic interference, which induces signals into pacemakers to alter their behaviour. These examples highlight how an adversary who can adulterate the signals output by a sensor can trick a secure operating system into processing, or worse, signing false sensor data. Current research objectives are to help hardware and software engineer designers to understand these vulnerabilities and to provide hardware and software solutions to ensure the trustworthiness of the data output by sensors. In the talk models will be described that help to understand how and why intentional acoustic interference causes unusual errors in the mechanics of magnetic hard disk drives, leading to damage to integrity and availability in both hardware and software. Then, models will be highlighted that help to cope with sensor-related issues, mitigating or compensating sensor signal errors induced by acoustic interference

Bio: dr. Sara Rampazzi achieved the Master Degree in Computer Engineering on 2010 and a PhD in Electronic and Computer Engineering on 2015 at the University of Pavia. Her research activity was mainly focused on Surface Plasmonic Resonance lab-on-chip sensors for analysis of biological liquid samples (for this activity she also achieved a national patent). On 2014, she was Visiting Researcher at the University of Las Palmas de Gran Canaria, where she was involved in high performance computing for hyperspectral image processing (Helicodi EU project). In the following years, dr. Rampazzi worked in Azcom and Alten as embedded software and firmware developer while recently she joined to the Security and Privacy Research Group led by the prof. Fu of the University of Michigan, where she mainly takes care of embedded security.

Organizer

Prof. G. Danese

Ph.D. Coordinator

Prof. P. Di Barba

Seminars will be held in English - For more information: gianni.danese@unipv.it