

**Monday, 12<sup>th</sup> October h 9:30**  
**University Campus Bio-Medico**  
**Via A. del Portillo 21, Rome, Italy**



Critical Infrastructure Preparedness and Resilience Research Network

# Lecture

## Secure Estimation for Wireless Control under Denial-of-Service Attacks

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### ABSTRACT:

Cyber-Physical Systems (CPSs) are systems found in a wide range of application fields such as power grids, smart buildings, transportation systems and unmanned vehicle systems. CPSs integrate physical processes, computational resources and communication capabilities. The feedback loop between the physical and the computational world through a (wireless) communication network increases the vulnerability of the entire system to failures or to malicious and intentional attacks by an external attacker.

In this talk a novel methodology is presented to estimate the state of the CPS when measurements and control inputs are corrupted by sparse attacks based on compressed sensing and error correction techniques.

Specifically, conditions are given for the system to be resilient against packet losses and adversarial attacks (e.g., DoS), characterizing the maximum number of corrupted signals that can be tolerated in order to perfectly recover the true system state.

The methodology is demonstrated with respect to a scenario where UAVs cooperatively transport a flexible payload.

**Gabriella Fiore** is a Ph.D. at the University of L'Aquila, her advisor is Prof. M.D. Di Benedetto. Her research interests focus on modeling and control of cyber-physical systems. She received her Bachelor's degree and Master's degree (summa cum laude) in Electronic Engineering (Microelectronic) from the University of L'Aquila. She has been a visiting student at the ABB Corporate Research in Västerås (Sweden). From March to August 2015 she was a visiting student researcher at the EECS Department, UC Berkeley, working in the group of Prof. C. Tomlin.

The participation is free, but registration is required for logistical reasons by sending an email to [g.oliva@unicampus.it](mailto:g.oliva@unicampus.it)

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