

**M14 – PARIS-SACLAY**  
09/04/2018-13/04/2018

**Modeling, analysis and design  
of wireless sensor and actuator networks**



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**Abstract of the course:**

Cyber-physical systems such as Smart Grids, Internet of Things Networks, and Intelligent Transport Systems, are supported by three main engineering components: sensing/actuating, networking, and automatic decision making. These components can be generally abstracted as a wireless network of sensors and actuators (WSANs). In WSANs, the new interaction of sensing/actuating, networking, and decision making is demanding the development of novel fundamental design principles, so to reliably observe the physical world, interconnect its units, analyze data and perform control actions, even with resilience, privacy and security guarantees.

This course presents the most relevant design principles of WSANs.

**Topics:**

- Mathematical modeling of networks and networked control systems;
- Resilient and secure methodologies for control-networking co-design;
- Networked optimization for WSANs;
- Mixed data- and model-based optimal control for large-scale WSANs;
- Experimental case studies on energy efficient buildings;
- Discussion of open problems and opportunities for research.

**Registration:** <http://eeciinstitute.web-events.net/registration/> (Advance registration before 28 December, 2017)