

## Scientific PhD offer Lupu Ciprian



University POLITEHNICA of Bucharest  
Faculty of Automatic Control and Computers

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### Professor Ciprian Lupu

PhD advisor in "Systems Engineering" domain

Doctoral School: Automatic Control and Computers  
University POLITEHNICA of Bucharest

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#### Research Profile:

##### Method for real time control (for linear and nonlinear process)

- Efficient hardware – software implementation– control library for diverse brands
- Direct and indirect adaptive Systems
- Hybrid Systems
- HwIL (hardware-in-the-loop) - > Automotive, Robotics, Power systems
- HuIL (human-in-the-loop) - > Expert systems
- Industry applications

**Solutions for multivariable process control**

- VPP – Virtual Power Plant solutions (sources and consumers integrations)
- Algorithms and structures for PV cells control
- Control for series and/or parallel systems (e.g. propulsion, pumping applications)
- Industry applications

**SCADA systems and architectures (with classic” and “special” domain applications)**

- “classic” – e.g. management for water, energy
- “special” – e.g. telemedicine
- Industry applications

**PhD advisor** from 2016;

- 3 thesis in progress;

**Publications:** 4 books / 3 chapters; >100 papers in journals and conferences.

**Research projects:** 7 as director, (selection, 5 in last 10 years):

1. "Methods and real time control strategies of implementing hardware and software systems for nonlinear processes: multimodel, adaptive, robust and internal model solutions ", contract: PNCDI II - IDEI 1044 /2007, - projects director
2. "Developing of software package for advanced researches in flow numerical simulation (AEROCFD)", contract: CEE X2C02/18.07.2006, director for UPB partner
3. "Control elements with integrated performing algorithms for industrial process control (ECAPI)", contract: PNCDI II - INOVARE 2007/1167/2007, director for UPB partner
4. "Researches for developing of telemedicine pilot system used on monitoring, diagnostic, localizing and person saves via satellite (SISTELMED)", contract: PNCDI II – P4 - PARTENERIATE 2008/82-095/2008, director for UPB partner
5. "Research for development a telemedicine expert system for providing optimal medical on site response in disasters and emergency situations management (using the latest technology in biosensors, satellite communications, satellite navigations IT etc.) (TELEDIM)", Program STAR, Project 43 / 2012, director for UPB partner

**Management Position: vice-dean (from 2012)****Scientific organization and committee, editorial boards:**

CEAI (Control Engineering and Applied Informatics)

Member in professional association:

IFAC, IEEE, SRAIT, A&C – Asociatia Automatica si Calculatoare (fondator member)

Organizer, chair, co-chair of different scientific events IFAC, IEEE (MED, WIICS, ICSTCC, ICEMES)

### **Proposed PhD thesis:**

#### **1. Nonlinear process control structure**

Objective: designing, testing and real time (TR) applications implementing of control structures for nonlinear process SISO / MIMO. The solutions are based on multiple model structures (MM) adaptive systems, nonlinearities compensate systems. Real-time Implemented solutions are based on market architectures (PLCs, microcontrollers etc.)

Specific areas of research: modeling, process identification, automatic control, real-time applications

#### **2. Load balancing in VPP structures**

Objective: designing, testing and implementing structures for consumers and producers load balancing in Virtual Power Plant (VPP) or micro grid networks .

Specific areas of research: modeling, process identification, automatic control, real-time applications

#### **3. Algorithms and control structure for photovoltaic (PV) fields**

Objective: control of a PV field. The idea is to increase the predictability of such resources in terms of atmospheric turbulence

Specific areas of research: modeling, data acquisition, automatic control, real-time applications

#### **4. Fault/leak detecting in distribution/transportation networks**

The objective: to propose efficient solutions for control and fault / leakage detection in fluids transport networks. May include control solution for the systems arranged in series and / or parallel (the propulsion, pumping).

Specific areas of research: modeling, data acquisition, automatic control, real-time applications.