International Master in Systems, Control & Information Technologies

www.gipsa-lab.grenoble-inp.fr/MiSCIT/
What is Automatic Control?
Two tracks: Industrial Process Automation (IPA) and Control & Systems Theory (CST)
Toward modern industrial processes

**Networks and Industrial Computation**
- Networks topology, design and communication
- Safety and security, medium and norm
- Wireless sensing, industrial automata and field buses

**Multi-objective Control**
- Global system understanding
- Model-based control: optimization, robustness and non-linearities
- Complex control applications.

**Modern Industrial Processes Automation**
- Increased complexity & communication
- Meet security, robustness, productivity & quality specifications
- Scalability and global system approaches
- System integration theory & technical capabilities.

**Modeling and Real-time Applications**
- Multi-physics for models, identification and estimation
- Embedded systems applications; Real-time applications with CRio and Labview

**Multi-scale models**
- Optimized design and Quality specifications

**Advanced Discrete Event Systems**
- Management of interlaced tasks: scheduling, logistics and simulations
- Automaton, Markov chains and petri nets
- Conception and design for industrial plants

**Networked Control Systems**
- Remote control and Embedded Systems

**Performance specifications and Quality constraints**
- Model-based control of large-scale systems

**Service-oriented network design**
- Tasks optimization for communicating devices

**Safety, Supervision and Diagnosis**
- Hierarchical context of monitoring and supervision
- Preliminary safety analysis
- Integrate automation in supervision and operator interface

**Project: 100h including Industrial Seminars: 27h**
Common classes with IPA:
- Multi-Objective Control
- Modeling and System Identification
- Hybrid Control
- Speech
- Project Management and Seminars

Research-oriented classes:
- Nonlinear & Predictive Control
- Modeling and Control of Partial Differential Equations
- Introduction to Data Assimilation
- Efficient methods in optimization
An international framework

**Partner Universities:**

**European**
AGH University of Science and Technology, Krakow, Poland.
Bilkent University, Ankara, Turkey.
Brno University of Technology, Czech Republic.
Haute Ecole de la Province de Liege, Belgium.
Silesian University of Technology, Poland.
Technical University Kosice, Slovakia.
University of L'Aquila, Italy.

**Non-European**
Embry Riddle Aeronautical University, U. of Central Florida, U. of Arizona, USA.
Institut Teknologi Sepuluh Nopember (ITS), Indonesia.
Lakshmi N. Mittal Institute of Information Technology (LNMIIT), Jaipur, India.
Universidad Pedagogica y Tecnologica de Colombia (UPTC), Colombia.
Université Libanaise, Lebanon.
Becoming of MiSCIT students after graduation between 2009 and 2013
Where are the students working after their degree?

Companies:
- Alpwise
- Renault
- EDF
- Volvo Trucks
- Eurosystème
- OMRON
- Rockwell Collins
- Petrofac Int.

- Thalès
- Sopra Group
- STRMGT
- ScoPT consulting
- Lockheed Martin
- Yokagawa
- SNECMA
- ...

Ph.D. in research labs:
- GIPSA-lab
- G-SCOP
- University of Kosice
- L2EP (Lille)
- INRIA
Simulation topics

- **Energy:**
  - Controlled thermonuclear fusion
  - Ventilation processes

- **Robotics:**
  - Drones

- **Environment:**
  - Human impact on atmosphere
  - Pollution control for Euro IV car engines
• **Intelligent buildings:**
  – Airflow regulation
  – Green buildings
• **Robotics:**
  – Exploration
  – Stabilization
E.g. Intelligent buildings ventilation

Ceiling plenum

Polluted air outflow

Fresh air inflow

Under floor plenum

Active diffusers

Exhausts

802.15.4 Sensors

802.15.4 PAN Coordinator

[VIDEO]
Intelligent buildings (2): control efficiency

P.-J. Meyer et al., 2015
How to join?

- You have followed at least four years of University and got the basics in Automatic control
- You are (almost) fluent in English

=> Follow the guidelines provided here:
http://www.gipsa-lab.grenoble-inp.fr/MiSCIT/admission.php

Note:
- Most of the tuition fee (about 6000 €) is paid by the French government: admission (including insurance) is less than 500 € FOR EVERYONE!
- Extra help from ERASMUS (EU students)
- Some excellency grants are also available
Welcome!