Mechatronics
Control software

## Themes

- Industrial computing
- Software architecture design
- Hard real-time fieldbuses
- Multiaxes motion control
- Advanced regulation
- Robotics
- Electronic design and industrialization
- Non-linear processes analysis
- High efficiency power supply

## Application fields

- Automation
- Production machines
- Tooling machines
- Industrial processes
- Measurement and quality control equipments

**A project to submit, an analysis to conduct, a solution to find ?**


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ISYS
Network of excellence
Integration and Systems

The HES-SO “Integration and Systems” network of excellence consists of over 150 engineers with recognized expertise in the fields of micro-systems, embedded systems, mechatronics and signal processing.

Five different thematic clusters have been created to gather the best competences of the network, independently from the location of engaged resources :

- Optical systems
- Sensors, actuators and conditioning
- Mechatronics and control software
- Nomadic systems
- High performance embedded systems

**Looking for more information ?**

**www.isys.hes-so.ch**


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Hes·so
Haute Ecole Spécialisée de Suisse occidentale
Fachhochschule Westschweiz
University of Applied Sciences Western Switzerland

# Mechatronics and Control software

16 professors and their team ready to face new challenges with you

ISYS
Network of excellence
Integration Systems

# Your needs Our skills

## Your needs

- Consulting and expertise
- Pre-studies, applied research and fast prototyping for technological risks evaluation
- Development and industrialization of electronic and software products
- Continuing education courses

## Our skills

- Automation and production machinery
- Analysis and design of software architecture for HMI and real-time control applications
- Embedded software
- Hard real-time fieldbuses : EtherCAT, SERCOS
- Electric drive techniques
- High performance regulation (state variable, robust)
- Multiphysics modeling
- Industrial electronic and software
- Multi-level and matrix energy converters
- Motion control mono and multiaxes, hardware and software (DSP) for power supplies and motion control
- Quantitative evaluation and automation of cognitive processus
- Magnetic bearings

# Recent projects

### Low-cost servo motor control over EtherCAT

Product development of full motion control at low cost with EtherCAT interface for a machine builder

### Control software for automated production machines

Object-oriented extensible software framework for controlling complex machines with multiple configurations. Real-time control, replacement of the CNC. Ease the adaptation of production machines to customer needs

### Validation of a new control concept for tooling machines

Design of a good concept for independence from suppliers of equipment and to facilitate the technological development of machines

### Dual-Differential Magneto-Rheological Actuator

Design of a rotative actuator with high torque density enabling fast, precise and stable mechanical interactions with environment

### Selfsensing for magnetic bearings

Save position sensors by using estimation algorithms

### Design and implementation of cooperative robots for assistance in domestic

Creating a mobile structure capable of moving independently in a home while cooperating with human

### IEC permanent magnet motor with high performance 3kW

Replacement of asynchronous machines by permanent magnet variable speed machines

# Our engineers at your service

**Thanks to a pro-active technological survey, our professors and their collaborators are positioned at the leading edge of their specialties. They will bring advanced skills to design new solutions to suit your needs.**

**Jean-Marc Allenbach**
Optimization of transportation systems

**Hans-Peter Biner**
Converters in the field of renewable energies

**Christophe Besson**
Electric machines and drive systems

**François Birling**
Software architecture for real-time machine control applications

**Pierre Bressy**
Embedded real time systems, industrial computing

**Mauro Carpita**
Power electronics and electrical drives

**Jean-Daniel Dessimoz**
Robotics, automation of cognitive processes

**Michel Girardin**
Wireless power transmission, drive at very high speeds

**Raoul Herzog**
Robust control, multiphysics modeling, magnetic bearings

**Michel Lauria**
Modeling of robots, haptic interfaces, mobile robotics

**Jean Daniel Marcuard**
Automation, Robotics and Safety

**André Rotzetta**
High-efficiency and uninterruptible power supply

**Carl Schmitt**
Micromechanic, medical robotics

**Bernard Schneider**
Machine automation, motion control, safety, fieldbus

**Yvan Terés**
Mobile measurement systems & low-power micromotors

**Maurizio Tognolini**
Switched mode power supply with soft switching, power control unit