High Performance
Embedded Systems

Development methodology

- Software/hardware partitioning (co-design)
- Validation and verification
- Multistandard approach (protocols, interfaces, normalization)

Software expertise

- Embedded and real-time operating systems
- Hardware virtualization techniques
- Peripherals drivers and middleware

Hardware expertise

- 32/64 bits microcontrollers and DSP
- Programmable and reconfigurable circuits (FPGA)
- Multicore processors technologies
- System-on-Programmable-Chip (SoPC) and IPs

Application domains

- Integration of embedded systems
  - Data acquisition, processing and transmission
  - Routers, gateways and secured communications
  - Hardware accelerators
- Real-time systems monitoring
- Critical application development and rapid prototyping

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

Your contact :

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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

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

High performance embedded systems

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

ISYS.PE.027.B - 2011

ISYS
Network of excellence
Integration Systems

Your needs Our skills

Your needs

- Applied research and development (aR&D)
- Consulting, preliminary studies and expert reports
- Prototyping for assess technological risks
- Continuing education courses

Our skills

- Complex numeric systems with temporal and environmental constraints
- Numerical systems conception and verification methodology
- Solution finding for fast information processing on embedded systems (parallel algorithms, dedicated languages, …)
- Complex software drivers development
- Analysis, conception and development of real-time systems
- Intelligent interfacesdevelopment
- Reconfigurable systems development
- Signal processing algorithms development

Recent projects

Embedded communication system

Reconfigurable embedded system with a development framework (FPGA/Linux) enabling co-design of communication peripherals

High speed cryptographic processing

Study and implementation of a cryptographic system based on AES and DES based on a co-design approach

Porting of the real-time Xenomai kernel on ARM

Adaptation of a real-time kernel on a Freescale i.MX21-based processor

Algorithms parallelization

Parallelization of image processing algorithms on one or multiple multi-core DSP

Development platform for fixed point signal processing

Complete development platform (Matlab & ISE) for linear applications (recursive filters IIR, lattice structures…) on a FPGA

PC104 FPGA board

Development of a Virtex FPGA system on a PC104 industrial bus

AMBA bus development tools

Development of a graphical environment for SOC architecture development based on AMBA bus and GRLIB

Hardware reconfiguration of embedded systems through secured internet connection

Use of a secured internet connection for reconfiguration of a deported system using a FPGA

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.

Christophe Bianchi

Industrial and spatial IPs, FPGA, µC

Claude Magliocco

High-speed I/O, filters and motion control on SoPC

Etienne Messerli

FPGA design/verification for complex systems

Pierre-André Mudry

Compilers, co-design, embedded parallelism, FPGA

Denis Prêtre

Fixed-point signal processing on DSP or FPGA

Daniel Rossier

OS, RTOS, virtualisation, drivers, middleware

Michel Starkier

Signal processing, audio, video, communication, FPGA

Yann Thoma

FPGA verification/design, embedded software

Andres Upegui

Reconfigurable systems that dynamically adapt

Fabien Vannel

FPGA, high performance, distributed architecture

Luigi Zaffalon

Reactive and real-time systems, synchronous programming