

With its broadly-encompassing technological skill set, the HEIG-VD's Institute of Industrial Automation (iAi) is a first-choice partner, active in the fields of automation, robotics, and mechatronics since 1999.

Leave your project in the hands of a team of competent, experienced, versatile engineers and academics and walk away with ready-to-go solutions.

<http://iai.heig-vd.ch>



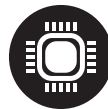
Robotics

- Analysis and optimization of production methods by means of systems and/or motion sequences for improving cycle times,
- Cooperative mobile robotics for domestic applications,
- Mechatronics and automated knowledge processing.



Optics

- Complex opto-mechanical and opto-electronic integration,
- Adaptive optics,
- Biomedical optics,
- Photonics,
- Modelling and simulation of end-to-end optical systems.



Industrial electronics

- Development of electronic equipment from prototype to final industrial version,
- Analogue, digital, and power electronics,
- Development of power amplifiers for motor controls or electromagnetic actuators,
- Spark generation; process control and axis control in spark erosion,
- Power electronics for electric vehicles, contactless energy transfer,
- Energy outputs, optimization of the production cost and reliability of small and medium (1 W–1000 W) chopped electrical power supplies,
- Fast prototyping of electronic systems,
- Electromagnetic compatibility and pre-certification compliance,
- Characterization of high frequency (up to 10GHz) data links, cables, connectors, PCBs.



Biomedical

- Biosignal acquisition and processing (ECG, EEG, etc.),
- Monitoring of vital signs and physiological parameters,
- Medical imagery,
- Diagnostic and therapeutic systems,
- Regulatory requirements for medical devices.



Mechatronics and Regulation

- Design of devices incorporating mechanical and electronic features,
- Industrial process modelling,
- Regulation and control techniques,
- Optimal control and optimization of trajectories,
- Motion control, active vibration damping,
- Robust control, auto-tuning,
- Machine safety.



Computer control

- Full design and development of software for machine control systems,
- Industrial automation software, standard IEC 61131-3,
- Fieldbuses and Industry 4.0 protocols,
- Machine controls, path calculations, CNC,
- Graphic interfaces, UML/C#/C++ expertise,
- Internet of things (IoT), Web and cloud.



Signal processing

- Signal acquisition techniques,
- Linear and nonlinear filtering, statistical processing, linear system identification, speech processing,
- Design of acquisition chains and choice of digitizing systems,
- Real-time signal processing in DSP and fixed point microcontroller,
- Fast prototyping of signal processing solutions on dedicated targets.



Sensors, Instrumentation, Metrology

- Current sensors (Hall effect, Rogowski coil),
- Energy metering: phase voltage, current, and grid frequency measurements,
- Wireless transmission of measured values (Bluetooth, ZigBee),
- Development of specific eddy current brake sensors for NDT applications,
- High-precision absolute position sensors, self-sensing electromagnetic actuators,
- Precision measurements in a purpose metrological environment,
- Ultrasonic sensors for process control.



Machine vision

- Image acquisition: lighting design, choice of optics, sensor selection, optical filtering,
- Theoretical analysis: modelling, optimum processing algorithms, simulation on real data, process robustness,
- High-speed image processing: implementation of algorithms for real-time execution in DSP or CPU, optimization in GPU for critical cases, capitalization of developed algorithms in a portable C++ image processing library,
- Software development: management of all software production phases (design, development, testing, on-site integration), software engineering workshop, market-standard or specific development tools according to needs.

Institute of Industrial Automation

(iAi)

Types of service provided

As well as basic undergraduate, postgraduate, and post-academic training, the iAi also pursues a technology transfer mission in the form of applied research and development projects (R&D):

- Direct services to SMBs: orders, assessments, consultancy, in-house training, etc.,
- Projects jointly financed by the Swiss confederation (CTI, FN, OFEN, etc.), the European Union (FP7, INTERREG), the economic promotion of regions, etc.,
- Degree projects sponsored by SMBs and carried out by undergraduates (500h) or postgraduates (900h).

The iAi is a member of a network providing SMBs with access to complementary skills:

- SwissT.net: this association aggregates 400 Swiss companies, all active in the field of automation and electronics.

Contact us

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Financing schemes

The R&D Innovation and Technology Transfer centre at HEIG-VD facilitates access to Swiss and European funding, according to the requirements and nature of your collaboration with the institute, who will guide through the process.

HEIG-VD

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The 13 institutes and multidisciplinary R&D groups at HEIG-VD are genuine innovation drivers.

- Around 300 graduated professional researcher,
- About 200 R&D projects per year,
- An annual turnover of over 15 MCHF,
- More than 20 start-ups registered with the register of businesses.