Research Institutes
HES-SO University of applied sciences
western Switzerland

eHealth Research in Valais

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Le Valais, premier pôle suisse dédié aux technologies de l’information

- Favorise les synergies entre instituts de recherche et entreprises
- Ra+D et Innovations au service du développement économique
- Financement pour les PME – Innosuisse – THEARK – H2020 – Eurostars - etc...
Innovators & platform to engineer innovation efficiency at scale

600 emplois
60 entreprises
Research vision

- Medicine is getting increasingly data intensive
  - Digital patient is (becoming) a reality
  - Health records, Health monitoring, Internet information, social networks, genomic data, ...

- Our main objective is to support the health domain
  - ... by connecting data and people
  - ... understanding and combining multiple data sources for reliable interpretations
eHealth in Sierre

ehealthsuisse

• History:
  – Many eHealth projects since 2007 – European projects
  – eHealth unit since 2011

• Applied research, committed to Innovation

• Close to user needs, with strong links:
  – locally (Hôpital VS, Logival, …),
  – nationally (CHUV, HUG, EPFL, …) - FNS Ambizione
  – internationally (Stanford, Harvard, Imperial College, Carnegie Mellon, NLM, …)
The pressure to dramatically multiply supercomputing capacities in the next few years is a first-class challenge for highly data driven activities such as:
- scientific research
- health
- engineering
- global consumer services

This project is co-funded by the European Union’s Horizon 2020 Programme for Research and Innovation.
The Health Technology Innovation Center of the HES-SO Valais-Wallis is an interdisciplinary Center for Sustainable Health Technology Development. Its value chain is based on the following strategic axes:

- Molecular diagnostic assay and systems development
- Sensor developments & integrated devices
- eHealth applications & data analysis
- Healthy food
In the context of an aging society and an increasing number of patients with chronic diseases, a shift of paradigm is needed towards a sustainable management of health, in order to enhance:

- Early detection and prevention of diseases
- Healthy behaviors & nutrition
- Patient empowerment & health literacy
- Seamless and coordinated care
- Chronic disease management
- Socially integrated care and independent living
- Rehabilitation
HTIC
Health Technology Innovation Center

Coordinator
Prof. Michael Schumacher

Vice-coordinator
Prof. Marc Pfeiffer

Institute of Information Systems
Prof. Michael Schumacher, Prof. Henning Müller

Institute of Entrepreneurship & Management
Prof. Alexandra Hugo, Prof. Eric Michellod

Institute of Tourism
Prof. Marc Schnyder, Prof. Rafael Matos

Institute of Social Work
Prof. Patricia Pham, Prof. Peter Voll

Institute of Health
Prof. Roger Hilfiker

Institute of Life Technology
Prof. Marc Pfeifer, Prof. JM Segura

Institute of Systems Engineering
Prof. Martial Geiser, Prof. Pierre Roduit
SL-DESUTO BOX

- Decision support Toolbox to diagnose and evaluate the prognosis of different types of cancer
  
  Objective: Make cancer diagnosis faster and more reliable through artificial intelligence.

Histopathology Images

• Deep Learning
• Machine Learning
• Computer Vision

Computer Assisted Diagnosis of Cancers
Software assisted diagnosis of cancers

- The composition of most diseased tissue is heterogeneous [1]
  - Patient prognosis and treatment options depend on this complex molecular profile
  - Limited use of invasive biopsy-based molecular assays


**POINT-OF-CARE TESTING**
- Low volume blood testing
- Quantitative
- Specificity towards metabolites
- Miniaturized

**INTERPRETATION AND DOSE ADJUSTMENT**
- Is the result expected?
- Is the drug still suitable?
- Prediction and dose adjustment

**DATA EXCHANGE AND INTEROPERABILITY**
- Upload patient’s data
- Extension of eHealth medical standards
- Data integrity
CTI COMPASS

• BioVotion: Swiss based medical device company

• Creation of a Personal Health System (PHS) to monitor the physiological parameters of patients affected by e.g. **Chronic Obstructive Pulmonary Disease (COPD)** and associated chronic illnesses

• **Predict the physiological state as a support**
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