idiap
RESEARCH INSTITUTE

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A MESSAGE FROM THE PRESIDENT

SCIENTIFIC AND HUMAN ADVANCEMENT

Olivier Dumas, President of the Foundation Council, Idiap

Visionary and therefore inherently avant-guard, bold, enthusiastic, and tenacious—the Idiap Research Institute was founded in Valais in 1991. A few thousand miles away, Mikhail Gorbachev resigned as the people's democracies of Eastern Europe broke apart. It is almost 25 years since our institute was born, and in that time it has played its part in great scientific and human advancements.

An Internal Audit with Inspiring Findings

On the eve of this anniversary year, far from resting on its countless laurels, Idiap has continued on the path of a different kind of quest—that for perpetual development. In 2014, the institute chose to conduct an audit. Administrative structure, scientific quality in broad terms, technology transfer, the relationship with our partner EPFL—all these elements were examined by a commission of international experts. A 10-page report was submitted, and its conclusion is inspiring (see pages 10–11): Idiap is an internationally renowned research institute, is highly effective, and has been able to adapt to changes in its environment, and is—besides—a great place to work.

No wonder then that Brussels has tasked the institute's director—Hervé Bourlard—in collaboration with other European partners, with the job of roadmapping those future research scenarios that correspond to the challenges that our society will, tomorrow, be facing (see page 15).

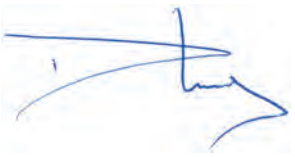
Links with the World of Business

The center of excellence IdeArk dedicated to multimodal interaction and the management of multimedia information, and led by Idiap Deputy Director François Foglia, amply fulfills its role as an interface with the business world. Numerous start-ups are developing business opportunities working closely with our researchers in Martigny. In the same vein, Idiap has begun approaching businesses present in the canton in order to place its specialist skills—in, for example, signal analysis, visual recognition, or robotics—at their disposition and to make its own contribution to resolving those difficulties found in production facilities.

Raising the Profile of Science in Valais

The ties that bind Idiap and EPFL have always been very close. EPFL is one of the founders of Idiap, along with the city of Martigny and the University of Geneva, and many of our senior researchers are now delighted to occupy roles as professors or lecturers and research supervisors at the prestigious Lausanne institution. Idiap welcomes the creation of the EPFL pole Valais-Wallis since its launch will, without a shadow of a doubt, raise the profile of a scientific Valais, which many are unaware of despite the fact that numerous institutions like Idiap have been operating successfully out of the canton for some considerable time.

More than twenty years after its birth, Idiap has changed. Valais too. The digital revolution and the concerns surrounding energy that have emerged in the "Old Country" echo those of the planet itself—concerns that, tomorrow, will urge on the fortunes of the institute, and of the canton too.



A MESSAGE FROM THE DIRECTOR

"DESPITE THE GLOOM IN EUROPE, WE HAVE BEEN ABLE TO DIVERSIFY, STRENGTHENING OUR POSITIONING"

Hervé Bourlard, Director, Idiap

Each year, at this time, the writing of our annual report demands a certain retrospection. This year, 2014, two key ideas stand out and synthesize the twelve previous months: our engagement in the regional economy and the expansion in the scope of our sphere of international activity.

Highlighting Our Work at the National and Local Levels

Our research groups—led by our best scientists—have once again endeavored to secure national or European projects, continuing their quest for innovation and their efforts to remain connected to the concerns of our society, all in the spirit of facilitating technology transfer. They are becoming more and more independent and complementary. Their work has always been recognized on an international scale, but also—and this is quite recent—it is also being highlighted at the national and local levels. This is happening not only thanks to the positions occupied by our researchers, such as Daniel Gatica-Perez, recently made an EPFL professor—and let us take this opportunity to congratulate him here—but also thanks to the transformation of certain of our innovations into regional reality.

With this in mind, Idiap is indeed very proud to present its new spin-off, BioWatch SA—the result of the participation in ICC'2014 (see page 18) of a PhD student from our research group specializing in biometrics. This new company, the ambition of which is to create a watch strap that authenticates its owner using the venous system of the wrist—more reliable than fingerprints, will certainly have a role to play in the fast-growing market for connected watches.

Maintaining Our International Positioning, despite the Gloom in Europe

Such regional success stories are all the more appreciated following the cruel twist of fate that occurred on 9 February 2014, by which the Swiss gave their popular approval to the initiative for the introduction of immigration quotas; in the process cooling somewhat the atmosphere in the ranks of European research, it must be said.

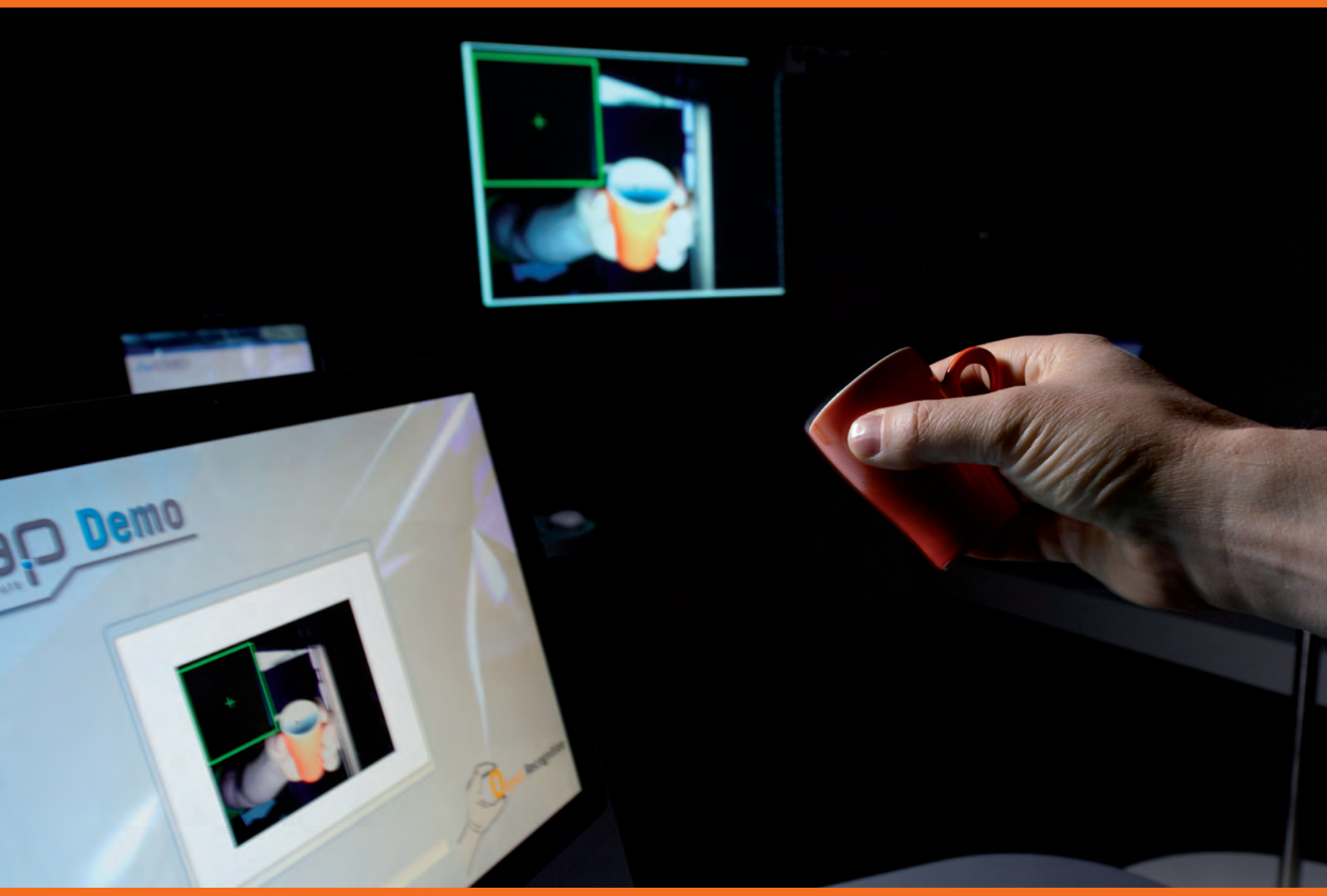
Our institute has, for example, been denied certain projects despite our tenders being awarded maximum possible points… A state of affairs that adds itself to the resizing of the lots called for by the EU. With increasingly reduced financial packages, shorter and shorter schedules, and a—often difficult to define—"priority to innovate", our scientists can no longer develop their ambitious research visions over the long term. Our institute is, thus, managing numerous research projects simultaneously, and these must be regularly renewed. Far from taking umbrage at this development, however, we have responded. We have diversified our research, better positioned ourselves vis-à-vis application areas rather than areas of fundamental research, and strengthened our strategic positioning in the field of data processing (multimedia and social media)—a discipline that lies at the heart of a great number of research projects. And, above all, we have ourselves created conditions ideal for a substantive approach.

The New Biometrics Center—A Milestone in Our Diversification

The founding—in the heart of our institute and by one of our senior researchers, Dr. Sébastien Marcel—of the Swiss Center for Biometrics Research and Testing, and its recent expansion to the European level, is certainly the most obvious recent example of Idiap's diversification (see page 17). Through this new initiative, Idiap—expert for over twenty years in biometric recognition (face, voice, etc.), and host to numerous regularly consulted reference databases—is not only positioning itself as a key player in Europe in the field of biometrics, it is also committing to becoming, increasingly, only one of the links in the long chain that connects research to practical applications that serve end users. With this center—which includes, from the outset, industrial partners in its approach—the Idiap Research Institute is truly taking the destiny of its own scientific discoveries into its own hands, and thus reaching a new milestone in its evolution.

My thanks and congratulations go to all Idiap's employees—researchers, developers, and administrative staff. Thank you all for your enthusiasm, for your professionalism, and for the friendly atmosphere you help to create. Here's to 2015!

RESEARCH



PROFILE

AN INSTITUTE ON A HUMAN SCALE, BUT WITH AN INTERNATIONAL REPUTATION

With over one hundred employees, and research domains in touch with current challenges, Idiap is committed to scientific progress in the service of humanity.

In 1991, at its foundation, the Idiap Research Institute first established its mission of promoting scientific progress in the service of the well-being of humanity. Today, over twenty years later, society's best interests remain at the heart of the institute's activities.

A Profusion of Technological Products

The beginning of the 21st century has witnessed the arrival of a profusion of new technological tools. On the one hand, these tools have made possible considerable improvements in efficiency and comfort. On the other hand, they disrupt people's habits, leaving some users impoverished, and others weary of constant system modifications. It is within this context that Idiap works, essentially to improve man–machine relationships, and to optimize human communication.

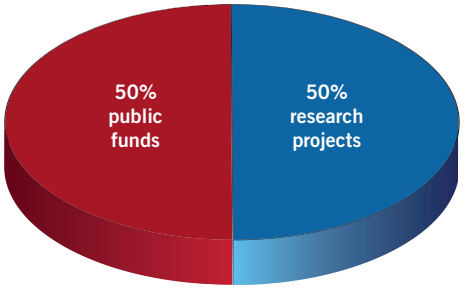
A National and International Network

In Switzerland, Idiap works mostly with the two federal institutes of technology, and with other universities of applied sciences and arts and cantonal universities at which research takes place. Idiap is currently working on several European projects, and maintains close links with its numerous partners, including those in France, England, and Germany. Across the Atlantic, Idiap and the International Computer Science Institute (ICSI) in Berkley, California, share a privileged partnership.

STRUCTURE

- Non-profit foundation
- Independent institution (but connected to EPFL through a joint development plan)
- Specializes in the management of multimedia information and man-machine, multimodal interactions
- Founded in 1991 by:
  - The city of Martigny
  - The State of Valais
  - EPFL
  - The University of Geneva
  - Swisscom

FINANCING



Research

To conduct fundamental research projects at the highest level in its chosen fields of expertise, thereby assuring its position among the best, nation-, Europe-, and worldwide. On the international stage, Idiap benefits from a broad network of partners and collaborates actively with, among others, public and private research centers, and large universities.
Competitive research projects guarantee 50 percent of the institute's financing.

Education

To support the educational process by helping its interns discover the world of research. Idiap welcomes talented young researchers working toward their PhDs, and provides them with numerous courses at EPFL.
One in two scientific contributors is a research assistant.

Technology transfer

To ensure technology transfer not only by promoting the widest possible dissemination of its research results into the scientific community, but also—and most importantly—by forging close ties with the world of industry.
Technology transfer generates 10 percent of Idiap's budget. Thanks to the incubator—The Ark, Idiap contributes to the creation of numerous successful start-ups.

IDIAP IN FIGURES (YEAR 2014)

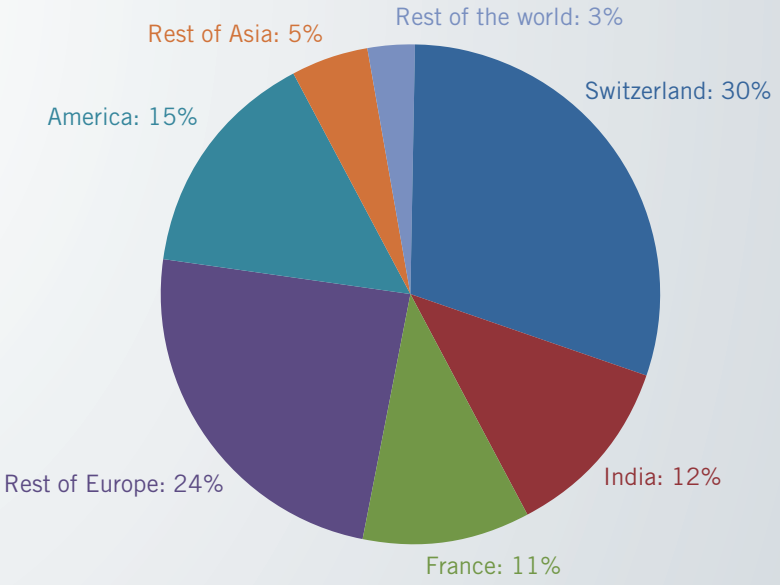
Human Resources

2	professors
2	senior scientists (MER)
13	permanent senior researchers
23	postdocs
37	research assistants
20	system engineers and development engineers
10	administrative staff
29	trainees (average/year)
4	visitors

140 people in total

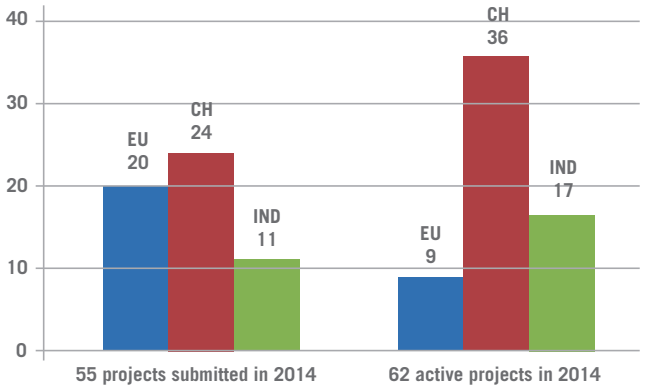
96 full-time equivalents

In total, 34 nationalities are represented at Idiap



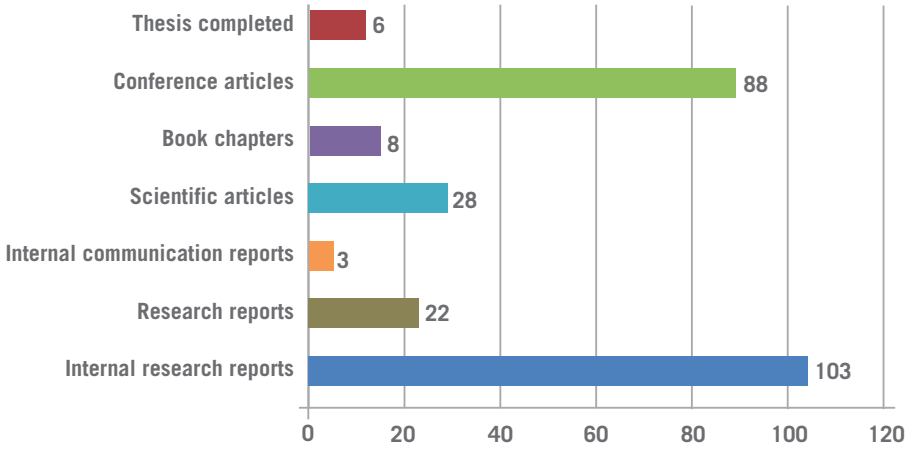
Scientific activities

- Participation in sixty-two research programs
- Project management in twenty-two consortia (Switzerland, Europe, industrial projects)
- Participation in the economic development strategy of the Canton of Valais through the program—The Ark and, in particular, the incubator IdeArk
- Forty-seven posts in seventeen IdeArk start-ups



Submission and financing of research projects

In 2014 Idiap submitted 55 projects (20 to European agencies, 24 to Swiss funding agencies and 11 industrial projects). At the same time the institute managed 62 active projects.



Publications

In 2014, Idiap researchers contributed to 258 published works.

5 RESEARCH THEMES & TEN APPLICATION DOMAINS

HUMAN–HUMAN, HUMAN–MACHINE & HUMAN–ROBOT INTERACTION
Voice-controlled devices, voice–voice translation systems, navigation systems

EXPLOITATION OF RICH MULTIMEDIA ARCHIVES
Semantic indexing, object recognition, audio–video content filtering, YouTube, document analysis, analysis of cultural heritage media

HOME AUTOMATION (DOMOTICS)
Multi-sensor activity analysis, human-behavior analysis, adaptation to human behavior (e.g., heating), home safety and security

ENTERTAINMENT AND GAMES
Multi-lingual gaming, remote-family games ("togetherness")

COLLABORATIVE AND CREATIVE SYSTEMS
Smart meeting rooms, video conferencing, multimedia indexing and access, cross-lingual collaboration

CITIES OF THE FUTURE (SMART CITIES)
Ecology, environmental management, pollution reduction, traffic reduction, better use of road networks, noise reduction

MANAGEMENT OF MOBILE SYSTEMS
Signal processing for mobile platforms, mobile social networks, modeling of human activity to anticipate needs

SECURITY AND RISK MANAGEMENT
Access control (for physical or virtual spaces), speaker identification, face identification, video surveillance, natural-risk modeling, safety of public and private spaces

ENERGY MANAGEMENT
Heterogeneous energy-networks, sensor networks, modeling of human activity to anticipate needs

HEALTH AND BIO-ENGINEERING
Smart patient (data-) management, protheses (auditory, corporal, etc.), bio-systems modeling, interfaces for the disabled, capture and indexing of medical documents

A Perceptual and cognitive systems
(automatic speech recognition, computer vision, handwriting recognition, multimedia document processing, robotics, machine translation)

B Social/human behavior
(web and mobile communication, social interaction, social signal processing)

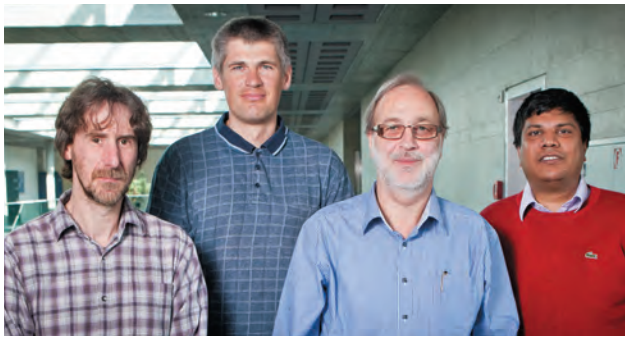
C Information interfaces and presentation
(multimedia information systems, personalization and contextualization)

D Biometric person recognition
(speaker recognition, face recognition)

E Machine learning
(statistical modeling, neural networks, mathematical models)

RESEARCH GROUPS

Ten groups, each led by one or more top-level scientists, divide the institute's research activities between them. The group responsible for speech- and sound processing is led by the institute's director—Hervé Bourlard—and three senior researchers. The remaining groups are all headed by senior researchers.



Speech & Audio Processing

Prof. Hervé Bourlard *(second from right)*, **Dr. Phil Garner, Dr. Petr Motlicek, Dr. Mathew Magimai Doss**
H-index*: HB: 49, PG: 19, PM: 11, MMD: 19

Speech processing has been one of the mainstays of Idiap's research portfolio for many years. Today it is still the largest group in the institute, and Idiap continues to be recognized as a leader in the field. The expertise of the group encompasses statistical automatic speech recognition (based on hidden Markov models or hybrid systems exploiting connectionist approaches), text-to-speech, and generic audio processing (covering sound source localization, microphone arrays, speaker diarization, audio indexing, very-low-bit-rate speech coding, and perceptual background noise analysis for telecommunication systems).

Social Computing

Dr. Daniel Gatica-Perez
H-index: 42

Social computing is an interdisciplinary domain that integrates theories and models from mobile and ubiquitous computing, multimedia, machine learning, and social sciences in order to sense, analyze, and interpret human and social behavior in daily life, and to create devices and systems that support interaction and communication. Current lines of research include ubiquitous sensing of face-to-face interaction, behavioral analysis of social video, crowdsourcing, and urban data-mining using smartphones and mobile social networks.

Computer Vision & Learning

Dr. François Fleuret
H-index: 24

The scientific objective of this group is the development of new statistical learning techniques, mainly for computer vision, with a particular interest in their computational properties. Application domains include image recognition and scene analysis, the tracking of people and biological structures, and the understanding of images in general.

Perception & Activity Understanding

Dr. Jean-Marc Odobez
H-index: 31

This group conducts research into human–human activity analysis using multimodal data. This entails the investigation of fundamental tasks such as the representation, detection, segmentation, and tracking of objects and people, the characterization of their state, and the modeling of sequential data and the interpretation of that data in the form of gestures, activities, behavior, or social relationships. These investigations take place through the design of principled algorithms that extend models from computer vision, statistical learning, or multimodal signal processing. Surveillance, traffic analysis, analysis of behavior, human–robot interfaces, and multimedia content analysis are the main application domains.

*The h-index attempts to quantify the productivity and impact of a given researcher based on the quotation pattern and frequency of that researcher's publications. The higher the index number, the more the citation level is important.

Robot Learning & Interaction

Dr. Sylvain Calinon
H-index: 28

The Robot Learning & Interaction group focuses on human-centric robot applications. The scientific objective is to develop probabilistic approaches for encoding movements and behaviors in robots evolving in unconstrained environments. In these applications, the models serve several purposes (recognition, prediction, online synthesis), and are shared by different learning strategies (imitation, emulation, incremental refinement, or exploration). The aim is to facilitate the transfer of skills from end users to robots, or between robots, by exploiting multimodal sensory information and by developing intuitive teaching interfaces.

Artificial Cognitive Systems

Dr. Barbara Caputo
H-index: 29

The Artificial Cognitive Systems group works on the development of multimodal learning algorithms to enable artificial agents to act autonomously in realistic settings, with a special emphasis on their ability to—autonomously—detect knowledge gaps and fill them with open-ended learning strategies. The focus of this work is on designing algorithms that are principled and computationally efficient and that provide robust performance in very realistic settings while at the same time providing theoretical guarantees on expected behavior. The group is funded by national and international funding agencies.

Applied Machine Learning

Dr. Ronan Collobert
H-index: 24

This group is interested in computer algorithms that can "learn" a behavior in order to perform a given task of interest, in contrast to algorithms with behavior constrained by handcrafted rules. This research is driven by real-world applications involving large amounts of data. Domains of interest include natural language processing, computer vision, and audio processing. A particular emphasis is placed on generic machine-learning tools, which require minimum a priori knowledge of the data (such as deep-learning techniques), and on unsupervised learning techniques, which can leverage inherent semantics from large-scale, structured data.

Computational Bio-Imaging Group

Dr. Michael Liebling
H-index: 17

This group focuses on research into computational imaging and the analysis of biomedical images. This includes developing algorithms for image deconvolution and super-resolution in optical microscopy, three-dimensional tomography reconstruction from projections, and—more generally—combining unusual sensing devices and approaches with computational methods to produce images ideally suited to the observation and quantification of complex and live biological systems.

Biometric Person Recognition

Dr. Sébastien Marcel
H-index: 28

Biometrics refers, in computer science, to the automatic recognition of individuals based on their behavioral and biological characteristics. The Biometric Person Recognition group investigates and develops novel image-processing and pattern-recognition algorithms for face recognition (2-D, 3-D, and near-infrared), speaker recognition, anti-spoofing (attack detection), and emerging biometric modes (EEG and veins). The group is geared toward reproducible research and technology transfer, using its own signal-processing and machine-learning toolbox.

Natural Language Processing

Dr. Andrei Popescu-Belis
H-index: 29

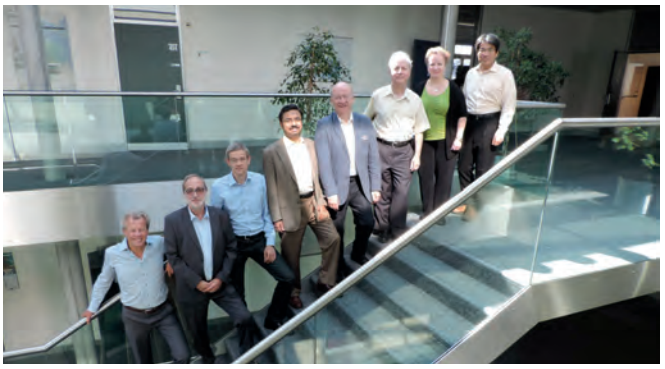
The Natural Language Processing group studies how the semantic and pragmatic analysis of texts can improve the execution of two important tasks—machine translation and information retrieval. In particular, the group studies how the recommendation of information from networked multimedia repositories can be improved by analyzing a network's structure and the information content of its nodes.

INTERNATIONAL AUDIT

IDIAP UNDER THE MICROSCOPE OF THE WORLD'S RESEARCH ELITE

In September 2014, seven of the scientific world's leading figures conducted an extensive audit of Idiap at the request of the institute's director—Hervé Bourlard. The seven experts were unanimous in highlighting Idiap's qualities, and also indicated some avenues that could lead to even further progress.

In 2014, Idiap was just two years away from celebrating its 25th anniversary and about to begin the process of renewing its public funding for the period 2017–2020. "It seemed the ideal moment for us to review the institute as a whole," says Bourlard, "including our research activities, our organization, and our relationship with EPFL." A rare process of reflection, welcomed by the audit committee, which also congratulated Professor Bourlard on his visionary and passionate management approach.



The Method—Preparatory Research, Presentations, and Meetings
In addition to documents provided by Idiap, the committee carried out the audit thanks to three days spent on site at the institute, from 3 to 5 September 2014. On the agenda, presentations by researchers, managers, and members of the scientific college, and face-to-face interviews with young researchers, postdocs, and graduate students. A few weeks later, the committee submitted a detailed report highlighting Idiap's strengths, and made suggestions regarding further improvements.

RESEARCH ACTIVITIES

Scientific Projects Provide Half of the Institute's Budget

The number of projects undertaken by the institute is growing while their size and duration have decreased, large projects such as IM2 or AMI/AMIDA having come to an end. Currently, more than half of Idiap's annual budget is drawn from national and international research projects. That Idiap, in this context, continues to increase its research budget is a positive sign.

Quality Resources and an Open-Source Philosophy

The best specialist journals publish articles by Idiap researchers, which reflects the degree of excellence of the institute. Its researchers also contribute in a remarkable manner to the creation of quality resources, particularly databases and software, often open-source in nature.

Constant Development of New Research Domains

In parallel to consolidating its pioneering activities in the field of speech recognition, now also applied to dialects—such as that of Upper Valais, for example—without lexicons, Idiap pursues its development activities in new research domains including robotics and biomedical imaging.

MANAGERIAL AND STRUCTURAL ACTIVITIES

The Collegial Atmosphere Helps New Arrivals

The friendly, collegial atmosphere, a culture of excellence, and the quality of the infrastructure present combine to make the Idiap research institute a great place to work. Students were particularly pleased with the help they received during their settling-in period in Martigny, and with the various measures aimed at encouraging social interaction.

High-Profile and Attractive

The 18 posts advertised over the last year attracted more than 500 applications. This illustrates the excellent visibility and attractiveness of Idiap, where no fewer than 34 different nationalities rub shoulders.

Members of the Audit Committee

The college was composed of seven leading figures from the international scientific community—some already familiar with Idiap, others who discovered the institute during the audit process.

- **Dr. Peter Buhler,** Department Head of Industry & Cloud Solutions at IBM Research Zurich (CHE)
- **Prof. Bernt Schiele**, Max-Planck Institute, Director MPI Informatics, Professor at Saarland University, Saarbrücken (DEU)
- **Dr. Prem Natarajan**, Director of the Information Sciences Institute (ISI), affiliated with the Viterbi School of the University of Southern California (USA)
- **Prof. Wolfgang Wahlster**, Director of DFKI, a non-profit contract research institute, affiliated with Saarland University (DEU)
- **Prof. Nelson Morgan**, Director of the Intl. Computer Science Institute, affiliated with the University of California Berkeley (USA)
- **Prof. Johanna Moore**, University of Edinburgh, Head of the School of Informatics, Director of the Human Communication Research Centre (UK)
- **Prof. Kenji Mase**, Graduate School of Information Science, Nagoya University (JPN)

RELATIONSHIP WITH EPFL

Significant Participation in EPFL's Academic Mission

Creating course materials, teaching, publishing scientific articles—Idiap's researchers play an important role in the academic mission of EPFL. Not to mention that they are training, at any one moment, over 40 PhD students.

Idiap—A Unique Setup That Deserves a Higher Profile

The diversity of its scientific domains and the scope of its mission (research, technology transfer, and training) make Idiap a unique setup that deserves greater recognition from its various partners. The committee recommends, in particular, that Idiap researchers be appointed to academic positions at EPFL.

RECOMMENDATIONS

Structure, Relationship with EPFL, Development, and Reputation

In concluding its report, the audit committee presented certain recommendations for improving Idiap's productivity and impact.

- To complete its organizational structure, Idiap could establish an advisory group—including scientists—tasked with planning future infrastructure investments.
- An intensification of the relationship with EPFL can be achieved by securing EPFL academic appointments for Idiap researchers and by establishing better connectivity between the two entities.
- The committee encourages Idiap to continue its exploration of new application domains (medicine, energy, etc.) and to create a partnership with those European organizations that are likely to facilitate Idiap's integration into major projects in the long term.

KNOWLEDGE AND TECHNOLOGY TRANSFER

Effective Solutions to Meet the Needs of Industry

Adapting research findings to the needs of the industry (technology transfer) is part of Idiap's mission. The institute is particularly effective in establishing influential practice (developer groups, the IdeArk business incubator, the International Create Challenge, etc.), to the great satisfaction of its partners, including industrial giants such as Nokia, Logitech, Yahoo, Samsung, and HP.

At the Service of the International R&D Community

Attentive to local, cantonal, and federal economic development, Idiap also places its expertise at the service of the international R&D community. Highly active in the transfer of knowledge between academic and industrial institutions, Idiap creates and makes available a significant number of professional software packages–a service that a traditional university structure could not hope to deliver.

Innovation Driver

By positioning itself as an innovation driver, Idiap is adopting a strategy that benefits Swiss industry. The recently created biomedical image processing research group and Swiss Center for Biometrics Research and Testing illustrate the institute's intention of remaining in tune with contemporary economic and societal needs.

VALAIS*WALLIS DIGITAL

JOIN IN CONSERVING THE COLLECTIVE MEMORY OF VALAIS

The project "Valais*Wallis Digital"—conceived and designed by Idiap in the frame of the bicentenary of the canton's entry into the Swiss confederation—invites *Valaisannes* and *Valaisans* to share their memories and archives (photos, videos, texts, etc.) with fellow citizens via its internet platform. If it is to succeed, the project needs to mobilize the entire canton.

1. Visit www.valais-wallis-digital.ch and create a user account

The platform is free to use and open to everyone, as is searching the database and consulting files.

Creating a user account allows you to submit your archives, add additional information to them, add comments to others' files, and contact other users of the platform.

2. Dust off your archives and search for treasures hidden away in your attic

Whether it's family photos, texts, or audio or video files, every item may be of historical interest. Don't let them be forgotten. Share them and help preserve the collective memory of Valais.

3. Digitize them

Only digitized documents can be submitted to the internet platform. To do this, you can either digitize them yourself using, for example, a scanner or a digital camera, or call a company that specializes in digitizing data, such as Martigny's *Cinetis*—a Valais*Wallis Digital project partner.

4.Share them on www.valais-wallis-digital.ch

Once your files have been digitized, connect to the online platform. Using the "My Documents" feature, you can now upload them, add comments, and share them with the online community.

While helping to conserve the Canton of Valais' heritage, you will also be directly contributing to research carried out at Idiap in the domain of digital sciences. This includes managing and indexing large multimedia databases created as a result of mass collaborative or participative projects of this and other kinds. This type of research has an impact that goes far beyond the Valais*Wallis Digital project—aiming to develop new technology and tools for addressing the major societal challenges of the future, such as energy management, health care, and the environment.

A Set of Cards Distributed by Migros in "Mania" Form

To encourage mass participation in the project, a set of cards has been created in collaboration with Migros Valais and the Academy of Contemporary Arts (EPAC) at Saxon. Featuring 200 years of the history of the "Old Country"—illustrated via as many cards—"Valais Digital Mania" offers a fun and interactive approach to the highlights of the period 1815-2015, each card presenting, in an entertaining way, one of 200 of the canton's historic events.

What's more, a free mobile application—designed to facilitate interaction with the Internet platform—provides collectors with more historical detail by offering, once a card is scanned, additional information concerning the event in question.

INEVENT—INDEXING MULTIMEDIA INFORMATION

The result of a three-year European project, the portal *inEvent* helps its users find a path through the jungle of multimedia data available on the Web. The Idiap-led project should help introduce the term "hyper-event" into our daily vocabulary.

Music videos, movie clips, mass production of leisure and hobby videos, streaming, online TED-type conferences, distance learning … Every minute, no fewer than 300 hours of video are uploaded to YouTube. And in the worlds of academia and business in particular, the use of video conferencing is becoming more and more widespread.

While systems such as Google are good at recognizing and sorting text, the indexing of audio and video content is—in comparison—a decidedly sketchy affair. How can this be remedied? The challenge is all the greater because, in addition to automatic transcriptions of videos, online comments and social network "likes" can sometimes be appended to the contents of the recorded events.

Multi-Dimensional Indexing of Multimedia Events Thanks to "Hyper-Events"

Conducted from November 2011 to October 2014, the European FP7 project "inEvent" aimed to provide users with multi-dimensional indexing for easier access to, and navigation through, these vast multimedia databases. Coordinated by Idiap, *inEvent* brought together academic and industrial partners, including giants IBM and Radvision, but also Klewel, an Idiap spin-off. The project's goal was to create a system that not only indexes multimedia experiences, but analyzes them from the inside—hence the name *inEvent*—and forges complex and pertinent links between them.

Called "hyper-events", by analogy with the term "hypertext", these links enrich multimedia content and make multi-dimensional searches possible: identifying, for example, conferences addressed by the same speaker and other events touching on the same theme, linking events taking place at the same location, or proposing similar content.

An Innovative Graphic Interface

"*InEvent* builds intelligent databases," says director of Idiap and *inEvent* project manager, Hervé Bourlard. "This project is a real tour de force of innovation. It includes the automatic segmentation of video, speech transcription, the identification of speakers, and semantic audio and video interpretation—all our areas of expertise." The design of the interface, with its keyword clouds, makes it very easy to identify the most relevant results—an intelligent approach that was recognized with an award at the ACM Multimedia Grand Challenge 2013, the world's leading conference on multimedia processing.

Another strength of *inEvent* is how it takes into account the emotional dimension of information. Imagine a sequence showing someone falling in the street. Is it dramatic or funny? Would a European viewer perceive it in the same way as an American or Chinese viewer? "The events of January 2015 in Paris showed us that not all cultures experience everything in the same way—humor being a particular example. With this in mind, it's easy to see how our system could become more and more useful in the future."

The system has been enthusiastically received and major partners have already expressed an interest. "They're unanimous in recognizing *inEvent's* potential for the world of business, but also for education and social media."

www.inevent-project.eu

Available in an Open-Source Format

The future direction *inEvent* takes depends not only on the project's industrial partners, but also on the wider world of software development, since inEvent project leaders have chosen to release code to the public domain in an open-source format. By doing so, they have made a significant contribution to our increasingly media-oriented society, calling on the talents of external developers to ensure further system improvements. Perhaps, in a not-so-distant future, the term "hyper-event" will be on the lips of all the world's digital media users.

PHASER

A CONCEPTUAL REVOLUTION NAMED PHASER

Idiap is working on a system of automatic speech recognition that should go far beyond the present state of the art. More robust and simpler than current systems, the model could also be more compatible with the mechanisms of the human auditory system as we understand them, leading to an impact far beyond speech recognition alone. The project, called PHASER, is funded by the Swiss National Science Foundation (SNSF).

How to exploit vast databases to build a speech recognition system that remains robust in the face of all kinds of variables? A system whose effectiveness will not be reduced either by the different accents of speakers, or by the recording conditions? Since June 2014, under the supervision of Prof. Hervé Bourlard, Idiap researchers (Dr. Afsaneh Asaei and research assistant Pranay Dighe) have been working on answering these questions in the context of a project funded by the SNSF: PHASER—Parsimonious Hierarchical Automatic Speech Recognition.

A Change in Paradigm

"We're supporting a paradigm shift in speech recognition. So far—and for over forty years now—every solution (commercial or research) has operated largely on purely statistical systems," explains Afsaneh Asaei, postdoctoral researcher at Idiap. In these models, only certain specific characteristics of the recorded data are extracted.

"By exploiting the recent resurgence of neural networks (deep neural networks)—a discipline never actually abandoned by Idiap—and the almost unlimited availability of memory and computational resources, the system proposed by PHASER aims to be able to conserve and fully exploit all data."

Combining Two Strategies to Improve Effectiveness

To build a system of automatic speech recognition using a large amount of data, the Idiap researchers combine two strategies. The first promotes simplicity and a parsimonious representation of information. This parsimony constraint usually leads to simpler and more robust systems.

"The second strategy favors structure and hierarchy. For example, to understand the content of a book, you first look at the jacket, then the title, and then the table of contents before reading all the details. This strategy is exploited by (human) cognitive systems. So it's very interesting to design a machine capable of carrying out tasks in a similar way."

An Award-Winning Innovation

PHASER therefore promises a particularly effective system of automatic speech recognition that implements two principles: simplicity or parsimony on the one hand, hierarchical structure on the other. Idiap's combination of these two key components represents an entirely new proposition. Indeed, one of the first research papers to present the premises of this approach was awarded the Best Doctoral Paper prize in 2011 at a conference (ICASSP—International Conference on Acoustics, Speech and Signal Processing) organized by IEEE (the Institute of Electrical and Electronics Engineers), an international professional association.

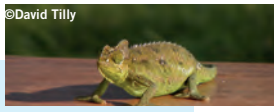
ROCKIT—ROADMAPPING TOMORROW'S EUROPEAN RESEARCH

In the shape of the European "ROCKIT" project, Idiap and its partners have been tasked with guiding research into human–human and human–machine interaction.

Draw up an inventory of current research, develop a strategic roadmap that identifies societal and industrial challenges, and thus identify those areas of research and development that require a particular focus between now and 2020. These are the aims of the ambitious European FP7 program-funded project ROCKIT (Roadmap for Conversational Interaction Technologies), launched in early 2014 and due to run for a period of two years. The stakes are high—the project must define the societal challenges that the European Union will face and assist the union in the development of a roadmap involving academia, industry, and the political milieu.

"The domain addressed by ROCKIT is natural language and conversation agents, or more generally anything that concerns multi-sensor interaction between humans and the devices of tomorrow: speech, translation, gestures, robotics, etc." explains Bourlard—the project's director at the institute. ROCKIT, coordinated by the University of Edinburgh, naturally has a seat at the table for Idiap—one of six project partners—given that the institute's research themes are so closely related to this field.

"Our task was to design five research development scenarios for the next ten years" (see below). Another aspect of the project is to bring together all the key players from the areas concerned under a single European research and innovation alliance that also involves commercial partners from the sectors concerned.

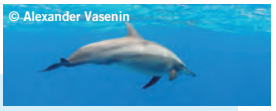


1. Adaptable Interfaces for all
Like a chameleon, interfaces should be able to adapt automatically to all their users—including children, the elderly, or disabled users—and to all circumstances. You receive a call while your hands are busy with a task? The phone detects this and automatically switches to visual mode, allowing you to pick up the call just by looking at the phone.

2. Smart personal assistants (SPAs)
A booming sector for technology, smart personal assistants help us in our everyday lives, while automatically adapting to the user, the context of use, and the sensors available, etc. While, today, they already provide appropriate responses to a whole range of questions, tomorrow they will be able to capture our emotions and, thus, guide users according to their preferences (travel, shopping, etc.).

ROCKIT partner institutions

University of Edinburgh—School of Informatics (GBR)
Idiap Research Institute (CHE)
Europe Unlimited (BEL)
LT-Innovate, the Forum for Europe's Language Technology Industry (Europe)
Saarland University (DEU)
Vodera (GBR)

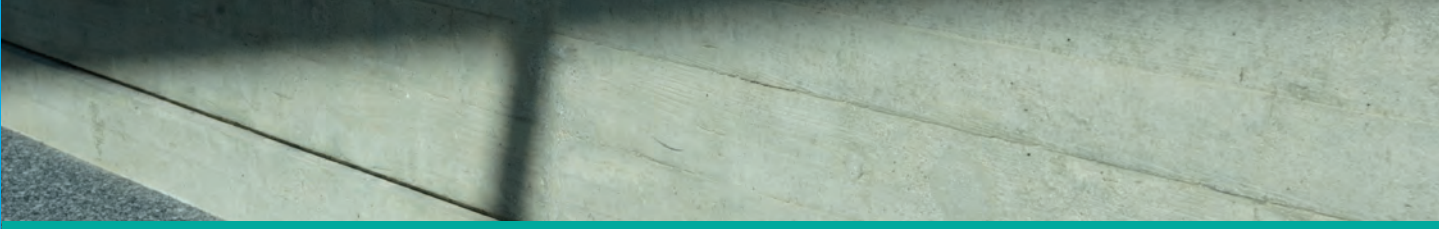


3. Active access to complex, unstructured information
Who has never felt lost among the increasingly large and heterogeneous information flows that are being endlessly generated? Dynamic, interactive systems will help users orient themselves. Better still—being proactive—they will sort out the relevant data to be transmitted, and find information more rapidly, without the need to explicitly launch a search tool.

4. Communicative robots
The development of robots, including "social robots", that interact with humans and adapt to their environment opens up broad new perspectives—robots as carers for the elderly or disabled, replacing humans to carry out difficult or dangerous tasks, carrying out surgical operations, etc. Many applications also concern children, providing educational tools and games, and also therapeutic support, particularly in cases of autism.

5. Shared collaboration and creativity
This scenario aims to deepen communication—multidisciplinary, multi-language, and "multi-social"—between humans and make it more effective. It is built on the strengths of the collective, which itself boosts creativity and facilitates problem solving. Social platforms and networked games are just two examples of systems that encourage us to work together, whether to share information within a multidisciplinary group or to play or boost our collective and individual creativity, while translation systems abolish the language obstacle. The result? Individuals are enriched by their contact with the collective group.

NETWORK



EUROPEAN BIOMETRY CENTER

BIOMETRY: AN ESSENTIAL SECURITY TOOL

Even if biometric recognition is today being integrated into more and more of the appliances that we use in our everyday lives, its reliability still raises many questions. A pioneer in the field of image and speech recognition, Idiap has hosted—since April 2014—the Swiss Center for Biometrics Research and Testing, and its European spin-off, EAB-CITeR.

No more passwords: the future is biometric identification, whether by fingerprint, iris, or face recognition, to mention only the most common methods currently available. Just as these technologies are becoming increasingly important in the fight against criminal activity, several projects—coordinated by Idiap at the European level (MOBIO—Mobile Biometry, TABULA RASA, and BEAT—Biometrics Evaluation and Testing)—are seeking to increase their reliability.

With the financial support of the Canton of Valais and the City of Martigny, and with the aim of positioning itself as European leader in the field, Idiap officially opened—in April 2014—the Swiss Center for Biometrics Research and Testing. Its objective: to enable the scientific community to carry out research, in a coordinated manner, by exploiting the institute's widely recognized expertise and the significant quantity of biometric data and software gathered at Martigny as a result of past, present, and future projects. "Only two similar structures exist in the world: one in the US and one in China. We will, in fact, be collaborating with the Americans," says Sébastien Marcel, senior researcher at Idiap and director of the center.

Research Funded by Corporate Contributions

The contacts established during the first meetings organized within the framework of the new center quickly convinced the sector's major European players to unite behind a common project, and so EAB-CITeR (the European Cooperative Identification Technology Research Consortium) was born.

Inspired by the American model (US-CITeR), the new competence center is based at Idiap under the control of the recently created Swiss center. It promotes a cooperative research model, uniting scientists, industry, and government agencies. "In practical terms, the institutions that join the project bring with them companies or other interested partners, who make financial contributions. The sums collected provide basic funding for research, the themes and projects of which are decided by the contributors. This mixed, public–private approach offers unparalleled opportunities for collaboration and cooperation between industry and researchers in order to advance biometric security technology." Thanks to initial financial support from the Canton of Valais and the City of Martigny, the center aims to be self-financing within one to two years.

Assessing the Compliance Levels of Programs and Applications

In addition to the research carried out at the center, aspects vital to the field—such as assessing results obtained and evaluating products going to market—are also top priorities. Joining itself to the European BEAT project, an online platform has been made available to researchers and companies enabling them to test their algorithms and software on the numerous biometric databases stored at Idiap. Besides the advantage of encouraging knowledge sharing within the scientific community, the tool also makes it possible to issue compliance certificates confirming the conformity of the programs tested, the validity of the results obtained, and the performance of the applications evaluated.

The center also works on spoofing—a group of attacks that are becoming more and more sophisticated, and that include the falsification of fingerprints, or facial reproduction with the aid of masks. "It's a question of identifying vulnerabilities and developing appropriate countermeasures. Some research paths are oriented toward the detection of vital signs, such as the blinking of the eyes, heart rate, or the use of new biometric modalities such as vein patterns, which are considered tamper-proof."

INTERNATIONAL CREATE CHALLENGE

A CHALLENGE IN THE FORM OF AN ACCELERATED BUSINESS INCUBATOR

For the third consecutive year, Idiap's International Create Challenge (ICC) has enabled researchers to transform their ideas into commercial prototypes. The three weeks of immersion at the institute have once again proved a resounding success. The 2014 edition rewards three projects that may, tomorrow, improve our daily lives.

From 26 August to 16 September 2014, Idiap hosted—in the form of a total immersion program—seven teams of aspiring entrepreneurs. In total, twenty scientists, designers, and prospective businessmen and women from Switzerland, the United States, Greece, Italy, or Turkey worked intensively on their respective projects.

Brand-new this year, a crowdfunding site to generate support for all projects submitted in the framework of ICC'2014: funding.idiap.ch. While the principal goal of such crowdfunding remains the visibility afforded to the projects, this new approach has also boosted the ability of young entrepreneurs to promote their products. And "certain investments indicate that the region has no shortage of investors and that this is an interesting approach," says François Foglia, deputy director of Idiap.

The jury of the 2014 edition—composed of leading figures from the worlds of research, venture capital, and innovation—distinguished three projects that combined innovation and high scientific quality.

BioWatch Secures Smartwatches by Reading the Veins in the Wearer's Wrist

BioWatch is the world's first smart, biometric watch that uses authentication based on the wrist's venous system. Goodbye passwords! Thanks to a sensor situated in the wrist strap, BioWatch identifies its owner with a reliability rate of 99.5 percent; better than fingerprints, or even voice- or iris-recognition. Inspired by the work of Joe Rice, a pioneer in biometric recognition using veins, the project is principally driven by Pedro Tome, postdoctoral researcher, and Matthias Vanoni, research assistant at the institute.

www.biowatch.ch

Horus—Personal Assistant for the Visually Impaired

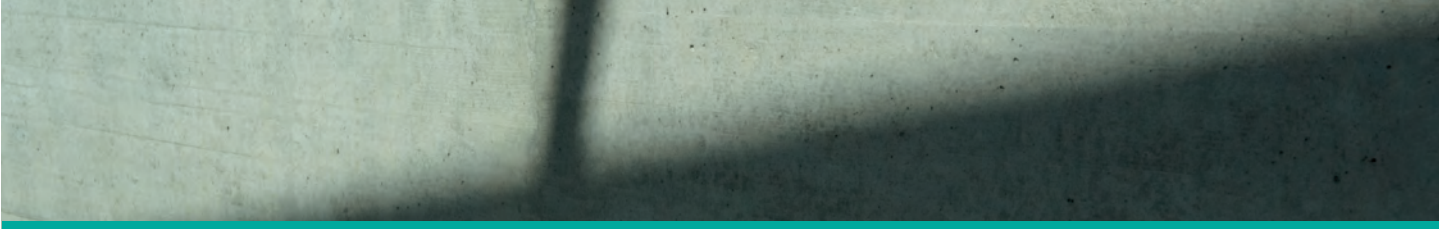
How do you choose matching clothes when you are visually impaired? Or read a bus timetable, recognize a friend, or see a crosswalk? Under the watchword "The invisible becomes audible", the Horus system looks like a small box that fits all types of glasses. The small camera it contains monitors the environment, analyzes it, recognizes images, and transmits information to the wearer orally. Horus can also store information, such as faces for example, according to a user's needs. A true revolution for the visually impaired.

http://horus.technology/en/

Anemomind—All Sails to the Wind

In November 2014, Alan Roura, the only Swiss sailor competing in *La Route du Rhum,* sailed with Anemomind—the "Digital Advisor for Smart Sailors"—onboard. The system processes data from a vessel's navigation instruments (wind speed, water temperature, etc.), stores and analyzes them, provides real-time diagnostics, and offers comparisons with previous readings, and even the possibility of sharing data. An idea born from the fact that currently used systems are complicated to calibrate and provide information that is difficult to use. Notably, Anemomind—the electronics of which were designed at the HES-SO Valais–Wallis—will be manufactured in the canton (Collombey-Muraz).

www.anemomind.com



THE HASLER FOUNDATION

THE HASLER FOUNDATION—SUPPORTING SWISS RESEARCH AND INNOVATION

The Hasler Foundation, whose incentive programs address the worlds of both research and business, regularly supports scientific projects and projects involving significant innovation, both at the national level. Since 2010, the foundation has contributed financially to around twenty of Idiap's projects.

Based in Bern, the Hasler Foundation (Haslerstiftung) invests several million Swiss francs each year in encouraging the development of information and communication technologies. It does so "for the good and the benefit of the Swiss cultural and professional milieus," and with the aim of ensuring for the country "a role of leader in the fields of science and technology."

Since 2010, around twenty Idiap projects have benefited from the financial support of the Hasler Foundation. Much of this support—so important for the institute—comes in the form of an independent research program set up to aid non-commercial institutions, providing funding for individual science and technology projects for up to three years.

Supporting Innovative Projects

In addition to fundamental or basic research, the foundation also supports the transfer of high-potential research findings when creating a spin-off is envisaged. This challenge—although extremely rewarding, both for the research milieu and for the young entrepreneurs concerned—is always difficult to overcome. For this reason, the foundation offers the future entrepreneurs engaged in the projects it supports additional resources for a maximum of 18 months in order to help the project survive this difficult phase.

The latest such measure granted to Idiap has encouraged the creation of the institute's latest spin-off, recapp IT AG. The project, funded to the tune of CHF 250,000, is supervised by Dr. David Imseng—recent graduate of EPFL/Idiap, research assistant at the Martigny institute, and co-founder of recap IT AG. "For us, this aid is essential and comes at just the right moment," says the researcher from Upper Valais. "Everyone wins. The Hasler Foundation because it knows that the money will be used well because it's being managed by a recognized and experienced research institute; Idiap because innovation and technology transfer are among its missions; and finally me, because I can put a team together and completely focus on the project."

Passionate about multilingual speech recognition—he dedicated his doctoral thesis to the subject—Imseng and recapp IT AG are developing a mobile application to record, archive, and reuse the content of meetings. With, as its starting point, the experience gained and the results obtained from the Valais parliament-based "Mediaparl" project (see AR12, pages 10-11) recap IT AG wants to further push the development of this tool, all the while focusing primarily on the Swiss market, and its languages and dialects.

Apple and Microsoft Interested

Already attracting interest from giants such as Apple and Microsoft, the application has also charmed other cantonal parliaments and is fêted wherever it is presented. Winner of the International Create Challenge 2013, finalist in Banque Cantonale du Valais' Prix Créateurs BCVS 2014, the application won grand prize in 2014 in LAUNCH—the UC Berkeley Startup Competition—where it competed with some 200 projects worldwide.

With the support of the Hasler Foundation, of Idiap, and of the business incubator The Ark, the recapp IT AG team is now working on its finished product. "We're a Swiss start-up, which uses Swiss technology, and makes a Swiss product." recapp IT AG—an innovation on a red field with a white cross.

recapp IT: www.recapp.ch

recapp IT AG's application recognizes languages, automatically generates text from the spoken word, and indexes keywords. Via a very rare feature, it can even manage speech that combines several languages, a situation so typical of many domains in Switzerland. It is already attracting interest from several cantonal parliaments, as it facilitates the work of those charged with recording, archiving, and making available the content of parliamentary sessions and debates.

From the Telephone to Information and Communication Technology

The Hasler Foundation—named the Hasler Works Foundation at its inception in 1948—was originally a corporate foundation. Its founder, Gustav Hasler (1877-1952), wanted to ensure that the Hasler Works, which had developed from the Federal Telegraphy Works, would continue to be run in the same spirit after his death. The foundation was also tasked with supporting "the telephony and telegraphy branches in Switzerland."

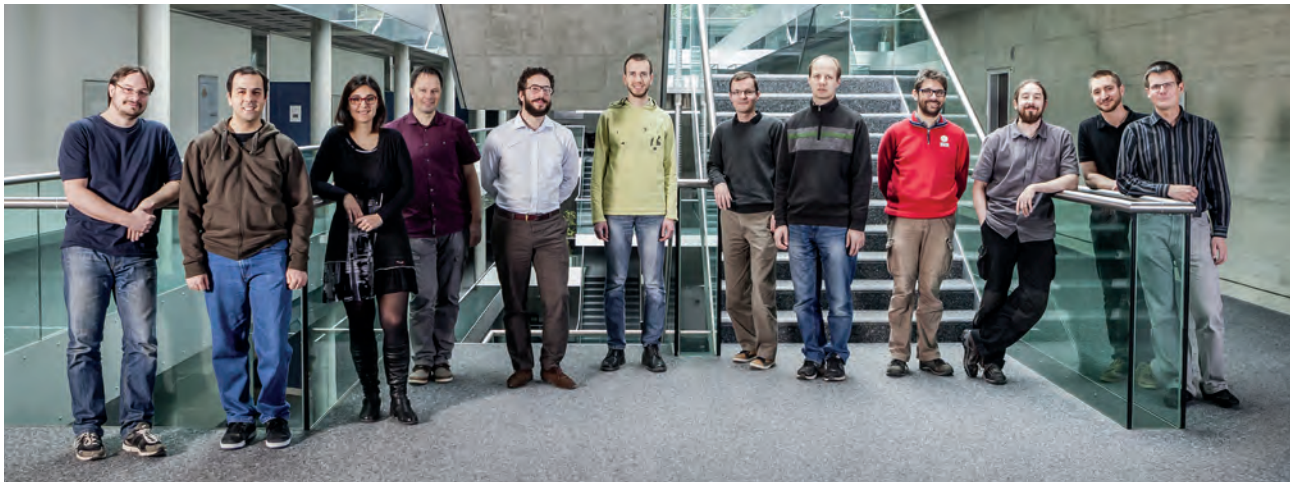
Today, free of any commercial interests, the foundation promotes education, research, and innovation in the field of information and communication technologies via annual investments of several million Swiss francs.

www.haslerstiftung.ch

DEVELOPMENT TEAM

THE TRANSMISSION CONNECTING THE MOTOR OF RESEARCH TO THE WHEELS OF INDUSTRY

Roles and responsibilities: the institute's development team continues to grow and transform. Spotlight on the behind-the-scenes workers who help convert Idiap's innovations from algorithms into products.



Without them, researchers' findings would never go beyond the realm of a set of mathematical formulas. Without their contribution, Idiap's innovations—even the most amazing—would never leave the field of research. They are the development engineers. People who—as the team's head, Olivier Bornet, observes aptly—"take research notes with them to meet with industry, so that in the end everyone can use the product." Engineers in their own right, they also contribute important—and often new—elements to Idiap scientists' findings, for example developing fully functional prototypes, which sometimes highlight certain shortcomings that need to be addressed.

Bornet took charge of the group in March 2014. A native of Nendaz, he knows the place well, as it is here that he took his first steps as a developer back in 1994—at the time, alone in holding such a position at Idiap.

Stimulating and Convivial Teamwork

Little by little, the department is expanding with the arrival of new colleagues—a logical evolution since technology transfer is among Idiap's missions, alongside research and training.

For several years, the development engineers were scattered throughout the site, each working individually for one researcher or another. Since late 2006, however, they have been working as a team, quartered on the fourth floor of the Centre du Parc. "This form of organization makes us more versatile; we're no longer tied to one particular project; rather we're linked to several," notes Bornet. "This creates a stimulating working atmosphere. Our connection goes beyond a mere working relationship: most of the developers take their breaks together and eat together at noon, alongside researchers and other employees of the institute."

Showcasing the Research Carried Out at the Institute

The development team currently has 14 members and a range of profiles. Some followed the HES (universities of applied sciences) route—at Sion or Yverdon, for example—others are from EPFL, and four have (EPFL) PhDs. "The presence of PhDs on the team is an important asset. They facilitate communication with the researchers, with whom they share similar knowledge and skills."

The whole team pulls toward the same goal: showcasing the many technologies produced by the institute's researchers in order to capture the interest of the industrial world. The creation of demonstrators is part of that mandate. Demonstrators like "IDEA", which creates a real-time audiovisual representation of a room and its occupants—represented by animated avatars—who we see moving around and talking. Many of these demonstrators are gathered in the showroom of the institute: what better way to show business leaders, school children, or members of the public the fruits of the research conducted at Idiap.

DEVELOPMENT TEAM

A Team Capable of Meeting the Most Diverse Demands

The development team's skills are relevant to every one of the institute's research themes. "We're able to meet the demands of all our researchers, whatever their project." From the creation of a database to the realization of an industrial product, there is no end to the requests that the group receives. These requests often come from Idiap start-ups (Klewel, Koemei, KeyLemon, recapp IT AG, etc.), but can also come from other companies in the form of calls for scientific collaboration with the institute. "Our role is obviously not to compete with local IT businesses, but when a project is highly specialized we're often the only ones with the necessary skills. Keep in mind that Idiap helps showcase research findings and develop collaborations with industry. But it never commercializes those findings itself."

Among the various projects that the team is currently working on, one comes from the French-speaking regional rehabilitation clinic (la Clinique romande de réadaptation—CRR / Suva). "The idea is to provide doctors with digital voice recorders, equipped with a voice recognition system adapted to specific medical vocabulary and able to handle the different accents encountered." Another project—running in collaboration with the Valais-based company ES Concept—aims to adapt, in real-time, advertisements displayed on billboards at sports events to the countries where those events are broadcast on TV.

Competence and Enthusiasm

In the team, the task of submitting industrial projects has—since 2014—fallen to development engineer Dr. Florent Monay. In collaboration with the researchers, Monay is responsible for drafting each proposal, and for its technical management once the project has been accepted. In this way, his task is to determine what solutions should be used to best meet the demands of industry.

Finally, two new developers joined the group in the last year (see box). "The members of our team are as competent as they are passionate," says Bornet. "And they are constantly improving how the team performs."

Hugues Salamin
33. Swiss. Lives in Dorénaz.
Idiap development engineer since 1 June 2014.
Specialist in artificial intelligence and automatic statistical learning.

"I already knew of Idiap as it was where I started my PhD in 2007, after my Master's at the Zurich polytechnic school. In 2009, I went—along with my supervisor (Alessandro Vinciarelli, now a professor at the University of Glasgow)—to Scotland, where I completed my doctorate, followed by a postdoc. The moment an opportunity at Idiap presented itself, I applied; the opportunity to come back "home" was too good to miss. I'm delighted to be here, especially as the work here is very interesting."

Frédéric Dubouchet
38. Swiss. Lives in Lens.
Idiap development engineer since 2 August 2014.
Specialist in graphics processing unit (GPU) computation.

"After a Bachelor's degree from the engineering college in Geneva, I worked at CERN for around 10 years while doing my Master's in parallel. I confess that I didn't know of Idiap before a friend told me that the institute was looking for development engineers. As I was dreaming of a move to Valais, particularly because I'm a keen skier, I applied straight away."

FACES

SYLVAIN CALINON, RESEARCHER

SYLVAIN—ROBOTS IN THE BLOOD

Sylvain Calinon heads the new Idiap research group dedicated to robot learning and interaction. A meeting with a researcher and "robot whisperer".

Since joining Idiap in spring 2014, Sylvain Calinon has shared his office with a singular individual. The size of a man, with a strong torso and long arms capable of supple, fluid motion; eyes moving behind its glasses and a quivering handlebar moustache.

Baxter—for that's the individual's name—is a robot. And he is the center of attention and the object of all Sylvain's care and research. The face of the young Swiss, trained at EPFL, lights up when he talks about Baxter. Never missing an opportunity to put his robotic charge to the test, he gives Baxter an object to grasp and begins to explain how the robot works.

His Profession—A Daily Passion

At 34, following five years at the Istituto Italiano di Tecnologia (IIT) in Genoa, Sylvain—a native of Yverdon—joined Idiap. Upon his arrival, the institute created a new research group: Robot Learning & Interaction (see page 9). "Given Idiap's competencies, I'm looking forward to seeing how many of them I can apply to the robot. Vision, motion, machine learning, verbal and non-verbal interaction: all of these can contribute to a robotics project. Moreover, thanks to the teams responsible for project management, development, and technology transfer, we have here an ideal environment in which to conduct our research projects."

Robotics is Sylvain's principal interest, his profession, and his hobby: a passion that infuses his daily life to the point that he talks more willingly of his chosen field than of himself. "From the beginning of my studies, it was clear that this is what I would do." A vocation established even earlier perhaps, as he recently found—among his childhood books—a volume entitled *The Robots.*

European Project in the Underwater Milieu

The research group Robot Learning & Interaction, directed by Sylvain Calinon, has already been awarded a major European project—DexROV, which begins in 2015 and will run for three and a half years. The project aims to create remote-controlled underwater robots, equipped with articulated arms, for the inspection and repair of pipelines and for oceanography, geology, and underwater archeology activities.
DexROV, which brings together seven academic and industrial partners, represents—for Idiap—incoming investment of nearly one million Swiss francs.

Science Fiction—An Unexpected Source of Inspiration

A robot like Baxter, capable of memorizing actions and reproducing them while adapting to its environment, immediately brings back memories of robotic characters from the movies. "The work of scientists is a source of inspiration for science fiction writers, and vice versa. We need to work faster—people are expecting to encounter in reality what they've seen on the big screen."

The development of a robot and its behavior requires a great deal of collaboration between scientists. Sylvain, who adores this aspect of his work, sometimes takes time out during his business trips to watch movies about robotics and artificial intelligence. For Sylvain, our vision of the robot is cultural: at times destructive, at times the savior of mankind. It goes without saying to which category belong the robots that he develops "In SMEs, they'll do uninteresting or dangerous work. They could also contribute to tasks in direct collaboration with people, as well as to rehabilitation, as exoskeletons attached to the body. Will they contribute to making the world a better place? I hope so. And, rest assured, we'll always need people. Who else would repair robots and teach them new tasks?"

MICHAEL LIEBLING, SENIOR RESEARCHER

A PASSION FOR PEOPLE

After ten years in the United States, returning to Switzerland Michael Liebling chose Idiap. The physicist, passionate about teaching, will head the institute's new research group devoted to computational bio-imaging.

From California straight to Switzerland. Michael Liebling had almost forgotten how harsh the winters of his homeland could be. A troublesome point when all his belongings were on a slow cargo ship somewhere on the ocean between the US and Europe.

But it would take more than that to make a hole in Michael's good humor, delighted as he was to join Idiap after over a decade stateside; an adventure that took him from the California Institute of Technology (Caltech) to the University of California at Santa Barbara (UCSB). "I was supposed to stay a year," Michael smiles. He left for the United States after obtaining his science doctorate from EPFL, supported in his postdoc studies by a young researcher's grant from the Swiss National Science Foundation. That year-long trip would last a decade.

Seduced by the Dynamism of Idiap

It's the summer of 2013, and Michael takes advantage of his vacation in Switzerland to visit Idiap. "I had always kept an eye on what was going on there, and was well aware of the institute's level of excellence. During my visit, I was seduced by Idiap's extraordinary dynamism. I also liked the idea that the institute not only leads large international projects, but also projects that have a local impact, like those relating to Valais' parliamentary proceedings or the bicentenary of the canton joining the confederation." Michael, 38, will form and lead the institute's new computational bio-imaging group (see page 9). "The challenge is to find the right people. I know they're out there. I just need the intuition to pick them out."

Fascinated by the computerized reconstruction of images, but also by medicine—he almost embarked on medical studies after high school—at UCSB the young physicist built up an interdisciplinary laboratory integrating biology. "I remember the very first meeting of my postdoc at Caltech: the biologists were talking among themselves; I listened to them, noting the words they used regularly. I was building lists of terms to learn."

Combining Research and Teaching

That California lab, which develops cell-imaging tools used especially for monitoring the embryonic development of the heart, is emblematic of the "Liebling method": building bridges between disciplines, empowering students, and passing on his knowledge in a manner both rigorous and inventive. If necessary, at the end of a demonstration, make something out of gelatin and food coloring? Michael didn't hesitate. When one feels, as strongly as Michael Liebling does, that "science is exciting", if a method works, you use it. "I asked the students themselves to create the images that we were going to use and to keep the biological samples alive. I think the more control we have over how we do things, the more effective we are."

His approach earned him the *Excellence in Teaching* award, conferred annually on the campus by the American conglomerate Northrop Grumman. "Nice recognition," commented Michael modestly, ever quicker highlighting the qualities of others than his own. Happily combining research and teaching, he admits to having spent a lot of time preparing his lectures. "It's very exciting: student's expectations are so varied. I combined a range of approaches so that everyone could get something out of them."

Michael's sharing approach seems second nature. "Collaborating with others is one of the nicest things one can do. I think I've never given a specialist conference presentation: I want my lectures to be as accessible to an engineer as they are to a biologist or a physicist."

Using fluorescence microscopy, Michael Liebling uses filters similar to those in this color chart to isolate the light coming from each type of tissue or cell, which have been previously marked with different dyes.

DANIEL GATICA-PEREZ, NEW EPFL PROFESSOR

"TEACHING IS A NATURAL EXTENSION OF RESEARCH"

Head of Idiap's Social Computing research group, Daniel Gatica-Perez also teaches IT Social Media at EPFL, where he has recently been appointed professor—a recognition shared.

Congratulations on your recent appointment as an EPFL professor. What does this change in status mean to you?
Even if the title of professor is bestowed on a personal level, I don't take it as such. For me, this appointment is a recognition of the years of work carried out by the Social Computing group that I lead. It is, therefore, also a recognition of the scientific importance of this field of research. More broadly speaking, it also recognizes the value of Idiap. I'm hopeful that the increased visibility that this appointment affords us will strengthen our existing synergies with other institutes and researchers, and even create new ones.

You have been teaching for almost ten years, alongside your research career. Is it easy to wear these two hats?
I see teaching as a natural extension of research. So—yes, I have no difficulty in conducting both these activities in parallel. Furthermore, they enrich each other. I learn a lot from the contact I have with the doctoral students who take my classes at EPFL. What I get out, I share with my research group and vice versa. The two activities are perfectly complementary.

Your research lies at the crossroads of computing and the social sciences. Is interdisciplinarity important to you?
Absolutely. A connection with other disciplines is central to my vision of research. I favor a transversal approach. I like the idea of tapping into other domains to find the answers to the questions we pose ourselves.

How, specifically, is this reflected in your research?
Our "SenseCityVity" project is a good example that combines urban planning, sociology, psychology, and social media. The aim is to mobilize citizens as factors of social change through the use of smartphones to help people understand socio-urban problems in certain cities and communities. We lead the project in collaboration with Mexican researchers, and with the support of CODEV—EPFL's Cooperation & Development Center.

You never hesitate to rely on communities, such as young people or students, for the production of research data. What are the strengths of such "crowdsourcing"?
From a scientific standpoint, it enables us to have a very large database, much richer than if we used traditional survey methodologies. The diversity of the data produced also guarantees us

a more representative result. But, beyond this, it's a question of involving citizens in a project by raising their awareness of the concrete benefits they can derive from it. Upstream, contextualizing the process is also crucial if we are to identify, as accurately as possible, the needs of the communities we are reaching out to.

Using your research as a lever for improving the well-being of communities is a constant factor in your work?
I place the human being at the center of my research, which is also one of the fundamental principles of Idiap. My projects always aim to produce a positive and concrete impact on people and their quality of life, whether it be at a local, a cantonal, or a national level. This is part of my responsibility as a researcher.

What are your principal projects for the future?
The SenseCityVity project is generating some very interesting results. At the end of the pilot phase, conducted in Mexico, I would like to roll the project out in Valais. And—once again in the spirit of mobilizing citizens—it's very close to my heart to develop new crowdsourcing projects in Latin America or in developing countries, such as India or Kenya.

MATTHIEU MABILLARD, INTERN

MY INTERNSHIP AT IDIAP MADE UP MY MIND

For over three months, Matthieu Mabillard swapped his position as an IT apprentice at Migros Valais for that of an intern at Idiap. A look back at how enriching the experience was and at the path traveled by this young native of Valais with his passion for politics and psychology.

First computer specialist hired by Migros Valais and the first intern to link up with Idiap's development team—Matthieu Mabillard enjoys a challenge. And that agrees with him rather well. At 19, he has an open mind but clear ideas. "I'll complete my apprenticeship in July. Then I'll complement it with a technical qualification one-year before starting a Bachelor's HES degree in computer science, most probably in Yverdon."

Computing—Of Course

Matthieu Mabillard caught the computing bug early and quickly developed a real interest in how programs operate. More than technology, it is mainly computing and software that feed his curiosity. "At the age of seven or eight, I was already trying to understand how the family computer worked. How to change a password, how to set options for folders… In a way, to understand what was going on behind the scenes." When the crucial moment came to choose his career, Matthieu had no hesitation. With his love of mathematics and logic, two options were open to him: follow his father into the world of finance, or pursue a career in IT. The second option won. And there are no regrets. "Whatever I chose, I'd have stayed in touch with figures. The only difference being that the *1*s and the *0*s don't have the same meaning from one field to the other."

Self-Taught

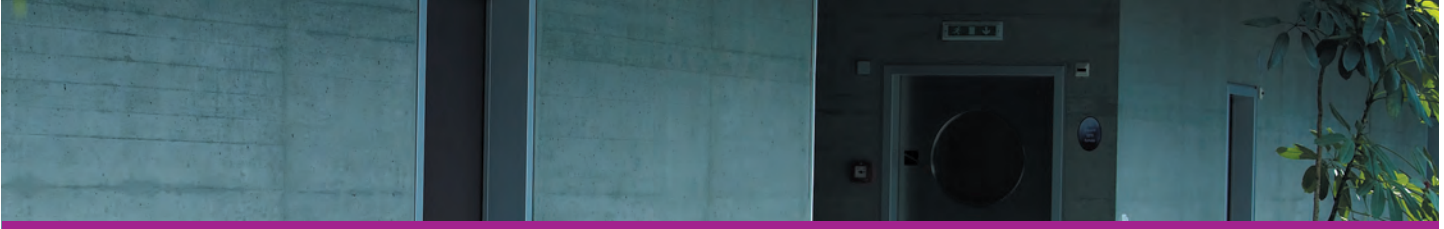
Matthieu, in the final year of his apprenticeship, had had little opportunity to flex his programming muscles—despite his passion for the discipline—during his time with Migros, where his daily schedule and that of his four colleagues runs to the tempo of maintaining the company's IT equipment (600 workstations in Valais) and providing user support.

The internship at Idiap came as a breath of fresh air, and Matthieu seized—again without hesitation—this unique opportunity to rub shoulders with the world of research and development to which he aspires. The atmosphere into which he plunged for three and a half months immersed him in the workings of an internationally renowned research institute, where scientists and researchers from throughout the world work side by side. "I was more used to asking people which valley they came from. At Idiap I had to broaden my horizons and think in terms of countries or even continents."

During the internship, Matthieu was actively involved in the creation of the Valais*Wallis Digital application for Android-based devices—a boon for a young man who describes himself as a self-taught programmer. "Without the opportunity to practice programming regularly in my job, I had to learn about the subject mainly by myself, topping up the basic information I'd been taught in courses. I deepened my understanding of C++ and Java by a lot of reading and amused myself by creating some fun programs at home, like a vocabulary revision program or a remote control application connecting my PC and my smartphone."

A Passion for Politics

Although his days are largely occupied by computing, Matthieu still does not forget to stay curious and open to the world around him. Interested in psychology and communication, as well as in the law, it is to politics that he devotes much of his free time. Not so much as a committed activist, more as an attentive observer. "I refuse to be labeled as a member of one party or another. What interests me are the debates and the discussions, whether on television or in the press." As in computing, Matthieu is trying to understand the hidden workings—exploring what lies behind the interviews, screen presence, and appearances.



JOINING AND LEAVING

In 2014, seventeen members of staff left and eighteen joined the team. The new arrivals include two researchers, two development engineers, seven research assistants, and one industrial relations collaborator.

JOINING US IN 2014

First name and last name, position, country of origin

Sergio Calabretta, industrial relations, Italy
Sylvain Calinon, researcher, Switzerland
Tatjana Chavdarova, research assistant, Macedonia
Tiago De Freitas, research assistant, Brazil
Subhadeep Dey, research assistant, India
Frédéric Dubouchet, development engineer, Switzerland
Charles Dubout, scientific collaborator, Switzerland
Sucheta Gosh, postdoc, India
Ivana Humawan, postdoc, Australia
Michael Liebling, senior researcher, Switzerland
Ngoc Quang Luong, postdoc, Vietnam
Parvaz Mahdabi, postdoc, Iran
Skanda Muraldihar, research assistant, India
Xiao Pu, research assistant, China
Dhananjay, Ram, research assistant, India
Mario Rosario, engineer, Portugal
Hughes Salamin, development engineer, Switzerland
Pedro Tome, postdoc, Spain

MOVING ON IN 2014

First name and last name, position, country of origin, joined Idiap

Sara Bahaadini Beigy, research assistant, Iran, 2013
Chidansh Amitkumar Bhatt, postdoc, India, 2012
Ronan Collobert, researcher, France, 2010
Charles Dubout, scientific collaborator, France, 2014
Nesli Erdogamus, postdoc, Turkey, 2012
Marco Fornoni, research assistant, Italy, 2009
Paul Gay, research assistant, France, 2012
Mohammad Javad, Taghizadeh, research assistant, Iran, 2010
Leonidas Lefakis, research assistant, Greece, 2010
Thomas Meyer, research assistant, Switzerland, 2010
Gelareh Mohammadi, postdoc, Iran, 2009
François Moulin, development engineer, Switzerland, 2009
Francisco Pinto, postdoc, Portugal, 2013
Yann Rodriguez, industrial relations, Switzerland, 2002
Mario Rosario, engineer, Portugal, 2014
Samira Sheikhi, research assistant, Iran, 2010
Gyorgy Jozsef Szaszak, postdoc, Hungary, 2012

DISTINCTIONS

AWARDS

Internal

Each year Idiap awards prizes to two of its research assistants. The first award is for research, the second for papers published. Candidates for the Research Prize are evaluated, by an internal commission, against five criteria: papers published, teamwork, commitment to a project, communication skills, and autonomy. For the Publication Prize, the institute's leadership draws up an initial list of candidates from papers of which an Idiap research assistant is the primary author. The members of the Advisory Board then evaluate, independently and anonymously, the papers selected.

In 2014 the Research Prize was awarded to **Kenneth Funes Mora** for his excellence in research on gaze estimation, contribution to data and software release, and animation of the Idiap and EDEE/EPFL PhD community. The Research Publication Prize went to **Laurent Son Nguyen** for his outstanding scientific article entitled "Hire Me: Computational inference of hirability in employment interviews based on nonverbal behavior".

External

This year, Idiap wishes to acknowledge its researchers' brilliant participation at international conferences. The quality of their research was rewarded with several distinctions.

Alexandre Heili and Jean-Marc Odobez

Best Paper Award at the IEEE Int. Workshop on Performance Evaluation of Tracking Systems (PETS), January 2014

Parameter Estimation and Contextual Adaptation for a Multi-Object Tracking CRF Model

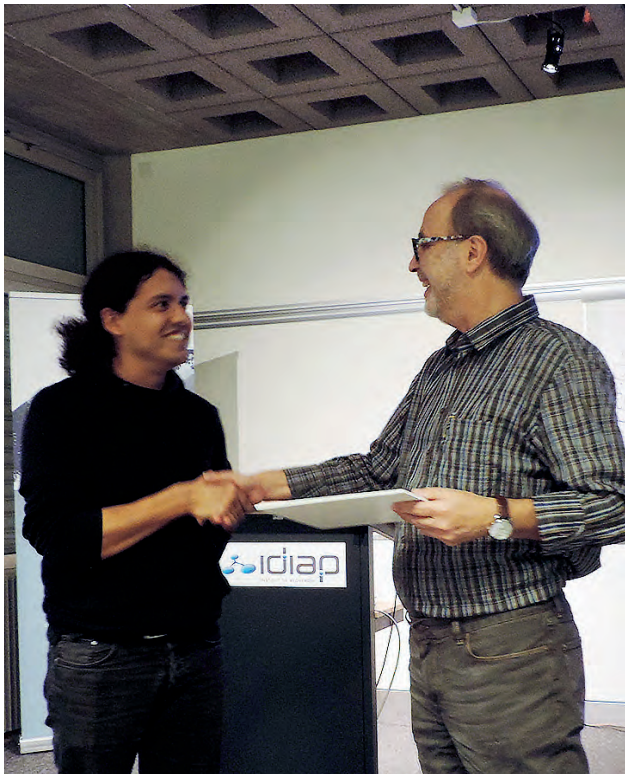
L. El Shafey, E. Khoury and S. Marcel

BTAS Best Paper Award at the International Joint Conference on Biometrics (IJCB) 2014

Audiovisual gender recognition in uncontrolled environment using variability modeling techniques

Sylvain Calinon

Excellence in Reviewing Award, Robotics and Autonomous Systems (Elsevier), 2014



Kenneth Funes Mora

Laurent Son Nguyen

THESES COMPLETED

Six students completed their theses in 2014: Laurent El Shafey, Marco Fornoni, Alexandre Heili, Thomas Meyer, Ramya Rasipuram, and Samira Sheikhi.

- ***Scalable Probabilistic Models for Face and Speaker Recognition***
  Laurent El Shafey, 24 March 2014
  Thesis directors: Prof. Hervé Bourlard and Dr. Sébastien Marcel
  Members of the thesis committee: Prof. Jean-Philippe Thiran, Prof. Josef Kittler, Dr. Jan Černocký, and Prof. Pascal Fua

- ***Saliency-Based Representations and Multi-component Classifiers for Visual Scene Recognition***
  Marco Fornoni, 26 September 2014
  Thesis directors: Prof. Hervé Bourlard and Prof. Barbara Caputo
  Members of the thesis committee: Prof. Colin Jones, Prof. Jean-Philippe Thiran, Prof. Vittoria Murino, and Prof. Danijel Skočay

- ***Human Tracking and Pose Estimation in Open Spaces***
  Alexandre Heili, 20 June 2014
  Thesis director: Dr. Jean-Marc Odobez
  Members of the thesis committee: Prof. Colin Jones, Dr. François Fleuret, Dr. Patrick Pérez, and Dr. Tao Xiang

- ***Discourse-Level Features for Statistical Machine Translation***
  Thomas Meyer, 8 December 2014
  Thesis directors: Prof. Hervé Bourlard and Dr. Andrei Popescu-Belis
  Members of the thesis committee: Prof. Jean-Philippe Thiran, Dr. Martin Rajman, Prof. Bonnie Webber, and Prof. Martin Volk

- ***Grapheme-Based Automatic Speech Recognition using Probabilistic Lexical Modeling***
  Ramya Rasipuram, 1 October 2014
  Thesis directors: Prof. H. Bourlard and Dr. M. Magimai Doss
  Members of the thesis committee: Prof. J.-Ph. Thiran, Dr. K. Knill, Prof. S. Renals, and Dr. J.-M. Vesin

- ***Inferring Visual Attention and Addressee in Human Robot Interaction***
  Samira Sheikhi, 11 July 2014
  Thesis director: Dr. Jean-Marc Odobez
  Members of the thesis committee: Prof. David Atienza Alonso, Dr. Daniel Gatica-Perez, Prof. Britta Werde, and Prof. Frederic Lerasle

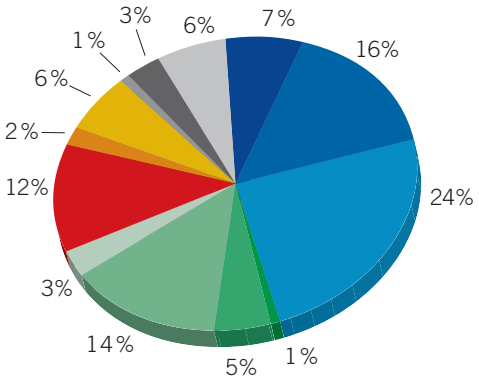
FINANCES

OPERATING ACCOUNTS

(Swiss francs)	2013	2014	%
INCOME			
City of Martigny	700,000	700,000	6.72%
Canton of Valais	1,620,000	1,720,000	16.52%
Swiss Confederation	2,400,000	2,550,000	24.49%
Loterie Romande	250,000	50,000	0.48%
NCCR IM2 projects	1,273,628	476,648	4.58%
Swiss National Science Foundation projects	1,489,392	1,427,889	13.71%
Hasler Foundation projects	314,717	371,045	3.56%
European Commission projects	1,132,694	1,210,890	11.63%
The Ark projects	189,288	173,797	1.67%
CTI projects	328,864	607,217	5.83%
EPFL contribution	72,000	72,000	0.69%
Industry financing	473,367	366,736	3.52%
Other income / extraordinary income	394,213	685,926	6.59%
TOTAL INCOME	**10,638,162**	**10,412,148**	**100.00%**
EXPENSES			
Personnel expenses	7,709,161	7,879,097	75.7%
Education and travel	458,200	355,766	3.4%
Third-party expenses	93,062	302,540	2.9%
Computer equipment and maintenance	241,310	246,284	2.4%
Administrative costs	193,520	233,001	2.2%
Promotion and communication	60,413	50,079	0.5%
Rent	817,621	818,888	7.9%
Depreciation	184,563	310,853	3.0%
Exceptional expenses	97,881	0	0.0%
Provisions	750,000	200,000	1.9%
TOTAL EXPENSES	**10,605,731**	**10,396,508**	**99.8%**
OPERATING PROFIT / LOSS	**32,431**	**15,640**	**0.2%**

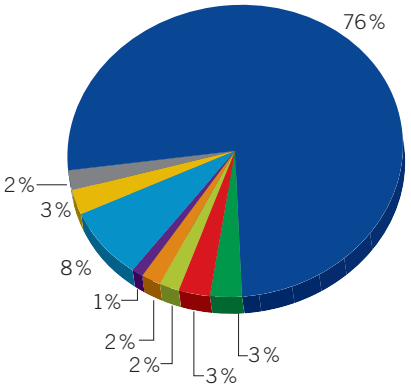
SOURCES OF FINANCING / COSTS / COMMENTS

Distribution of sources of financing



- City of Martigny
- Canton of Valais
- Swiss Confederation
- Loterie Romande
- NCCR IM2 projects
- Swiss National Science Foundation projects
- Hasler Foundation projects
- European Commission projects
- The Ark projects
- CTI projects
- EPFL contribuiton
- Industry financing
- Other income / extraordinary income

Distribution of costs



- Personnel expenses
- Education and travel
- Third-party expenses
- Computer equipment and maintenance
- Administrative costs
- Promotion and communication
- Rent
- Depreciation
- Provisions

Management comments

It is a pleasure to be able to note that, for the third consecutive year, Idiap has managed a budget of over 10 million Swiss francs.

Also, the proportion of public investment has once again met the strategic objective, set by the institute's management, of less than 50 percent.

The success rate with regards to European projects is, however, lower than in the past. This can be explained by the result of the federal referendum of 9 February 2014, which continues to generate uncertainty regarding the position of Swiss research in the European H2020 program, and a certain ostracism of Swiss partners.

Staff costs (salaries + social charges) make up the bulk of expenditures, at around 80 percent.

Idiap closes its 2014 financial statements with a surplus of CHF 15,640.

Federal, cantonal, and municipal subsidies

(In thousands of Swiss francs)

YEAR	2012	2013	2014	2015*
Confederation	2,393	2,400	2,550	2,495
Canton	1,120	1,320	1,720	1,720
Municipality	650	700	700	700

* Budget

BALANCE SHEET

(Swiss francs)	31.12.2013	31.12.2014
ASSETS		
Cash	3,614,085.58	3,172,241.55
Accounty receivable	220,492.98	315,159.11
Accrued income and other	985,382.87	502,413.88
TOTAL CURRENT ASSETS	**4,819,961.43**	**3989,814.54**
Equipment	340,658.79	515,818.64
Financial assets	10,000.00	10,000.00
TOTAL NON-CURRENT ASSETS	**350,658.79**	**525,818.64**
TOTAL ASSETS	**5,170,620.22**	**4,515,633.18**
LIABILITIES		
Accounts payable	307,725.05	300,607.00
Accrued expenses	2,921,723.22	2,058,214.07
Provisions	750,000.00	950,000.00
TOTAL FOREIGN FUNDS	**3,979,448.27**	**3,308,821.07**
Share capital	40,000.00	40,000.00
Special reserve	1,000,000.00	1,000,000.00
Retained earnings	118,739.57	151,171.95
Net income	32,432.38	15,640.16
TOTAL OWN FUNDS	**1,191,171.95**	**1,206,812.11**
TOTAL LIABILITIES	**5,170,620.22**	**4,515,633.18**

ORGANIZATION

ORGANIZATION CHART

01.03.2014

FOUNDATION COUNCIL

SCIENTIFIC ADVISORY BOARD

DIRECTOR
Hervé Bourlard

DEPUTY DIRECTOR
François Foglia

SCIENTIFIC COLLEGE
F. Fleuret, D. Gatica-Perez, J.-M. Odobez

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RESEARCH COMMITTEE

Admin

FINANCE & HUMAN RESOURCES
Ed Gregg

INDUSTRIAL RELATIONS
Sergio Calabretta

Services

SYSTEM & INFRASTRUCTURE
Frank Formaz

DEVELOPMENT ENGINEERS
Olivier Bornet

PROGRAM MANAGERS
Léonore Miauton

SPEECH & AUDIO PROCESSING
Hervé Bourlard
Phil Garner
Mathew Magimai Doss
Petr Motlicek

COMPUTER VISION & LEARNING
François Fleuret

SOCIAL COMPUTING
Daniel Gatica-Perez

PERCEPTION & ACTIVITY UNDERSTANDING
Jean-Marc Odobez

ROBOT LEARNING & INTERACTION
Sylvain Calinon

ARTIFICIAL COGNITIVE SYSTEMS
Barbara Caputo

APPLIED MACHINE LEARNING
Ronan Collobert

COMPUTATIONAL BIO IMAGING
Michael Liebling

BIOMETRIC PERSON RECOGNITION
Sébastien Marcel

NATURAL LANGUAGE PROCESSING
Andrei Popescu-Belis

EMPLOYEES

Scientists

First name and last name, position, country of origin, (place of residence), joined Idiap

Oya Aran Karakus, Research Fellow, Turkey, 2009
Afsaneh Asaei, Postdoc, Iran, 2008
Sara Bahaadini Beigy, Research Assistant, Iran, 2013
Chindansh Bhatt, Postdoc, India, 2012
Joan Isaac Biel, Research Assistant, Spain, 2008
Hervé Bourlard, Director, Switzerland, Saxon, 1996
Sylvain Calinon, Researcher, Switzerland, Gimmel, 2014
Gulcan Can, Research Assistant, Turkey, 2013
Olivier Canévet, Research Assistant, France, 2012
Barbara Caputo, Senior Researcher, Italy, 2005
Tatjana Chavdarova, Research Assistant, Macedonia, 2014
Ivana Chingovska, Research Assistant, Macedonia, 2011
Ronan Collobert, Researcher, France, 2010
Tiago De Freitas, Research Assistant, Brazil, 2014
Subhadeep Dey, Research Assistant, India, 2014
Pranay Dighe, Research Assistant, India, 2013
Trinh-Minh-Tri Do, Postdoc, Vietnam, 2009
Charles Dubout, Scientific Collaborator, France, 2014
Elie El Khoury, Postdoc, Lebanon, 2011
Laurent El Shafey, Research Assistant, France, 2010
Nesli Erdogmus, Postdoc, Turkey, 2012
Marc Farras Font, Postdoc, Spain, 2011
François Fleuret, Senior Researcher, France, 2007
Marco Fornoni, Research Assistant, Italy, 2010
Kenneth Funes Mora, Research Assistant, Costa Rica, 2011
Philip Garner, Senior Reseacher, England, 2007
Daniel Gatica-Perez, Senior Researcher, Mexico, 2002
Paul Gay Research Assistant, France, 2012
Sucheta Ghosh, Postdoc, India, 2014
Manuel Günther, Postdoc, Germany, 2012
Maryam Habibi, Research Assistant, Iran, 2011
Alexandre Heili, Research Assistant, France, 2010
Ivana Himawan, Postdoc, Australia, 2014
Pierre-Edouard Honnet, Research Assistant, France, 2012
Rui Hu, Postdoc, China, 2013
David Imseng, Postdoc, Switzerland, St. German, 2009
Cijo Jose, Research Assistant, India, 2013
Ilja Kuzborskij, Research Assistant, Lithuania, 2012
Alexandros Lazaridis, Postdoc, Greece, 2012
Rémi Lebret, Research Assistant, France, 2012
Leonidas Lefakis, Research Assistant, Greece, 2010
Joël Legrand, Research Assistant, France, 2012
Michael Liebling, Senior Researcher, Switzerland, St Sulpice, 2014
Ngoc Quand Luong, Postdoc, Vietnam, 2014
Srikanth Madikeri, Postdoc, India, 2013
Mathew Magimai Doss, Researcher, India, 2007
Parvaz Mahdabi, Postdoc, Iran, 2014
Sébastien Marcel, Senior Researcher, France, 2000
Thomas Meyer, Research Assistant, Switzerland, Martigny, 2010
Gelareh Mohammadi, Research Assistant, Iran, 2009
Petr Motlicek, Researcher, Czech Republic, 2005
Skanda Muralidhar, Research Assistant, India, 2014
James Newling, Research Assistant, England, 2013
Laurent Nguyen, Research Assistant, Switzerland, Lausanne, 2011
Jean-Marc Odobez, Senior Researcher, France/Switzerland, Clarens, 2001
Pedro Oliveira Pinheiro, Postdoc, Brazil, 2012
Dimitry Palaz, Research Assistant, Switzerland, Martigny, 2011
Nikolaos Pappas, Research Assistant, Greece, 2012
Novi Patricia, Research Assistant, Indonesia, 2012
Francisco Pinto, Postdoc, Portugal, 2013
Andrei Popescu-Belis, Senior Researcher, France/Romania, 2007
Blaise Potard, Postdoc, France, 2013
Xiao Pu, Research Assistant, China, 2014
André Rabello Dos Anjos, Postdoc, Brazil, 2010
Dhananjay Ram, Research Assistant, India, 2014
Ramya Rasipuram, Research Assistant, India, 2010
Marzieh Razawi, Research Assistant, Iran, 2013
Lakshmi Saheer, Research Assistant, India, 2008
Darshan Santini, Research Assistant, India, 2012
Ashtosh Sapru, Research Assistant, India, 2011
Samira Sheikhi, Research Assistant, Iran, 2010
Gyorgy Szaszak, Postdoc, Hungary, 2012
Mohammad Javad Taghizadeh, Research Assistant, Iran, 2011
Pedro Tome, Postdoc, Spain, 2014
Raphaël Ullman, Research Assistant, Switzerland, Lausanne, 2012
Matthias Vanoni, Research Assistant, France, 2013
Sree Harsha Yella, Research Assistant, India, 2010

Development Engineers

Philip Abbet, Senior Development Engineer, Switzerland, Conthey, 2006
Olivier Bornet, Senior Development Engineer, Switzerland, Pont de la Morge, 2004
Milos Cernak, Senior Development Engineer, Slovakia, 2011
Frederic Dubouchet, Development Engineer, Switzerland, Lens, 2014
Samuel Gaist, Development Engineer, Switzerland, Ardon, 2013
Salim Kayal, Development Engineer, Switzerland, Vevey, 2011
Vasil Khalidov, Senior Development Engineer, Russia, 2010
Christine Marcel, Development Engineer, France, 2007
Florent Monay, Development Engineer, Switzerland, Choëx, 2008
François Moulin, Development Engineer, Switzerland, Vollèges, 2009
Alexandre Nanchen, Senior Development Engineer, Switzerland, Martigny, 2008
Mario Rosario, Engineer, Portugal, 2014
Hugues Salamin, Development Engineer, Switzerland, Dorénaz, 2014
Flavio Tarsetti, Senior Development Engineer, Switzerland, Martigny, 2008

Administrative Staff

First name and last name, position, country of origin, (place of residence), joined Idiap

Sergio Calabretta, Industrial Relations, Italy, Martigny, 2014
Antoine Dorsaz, Financial Assistant, Switzerland, Fully, 2012
Christophe Ecoeur, Program Manager, Switzerland, Collombey, 2010
Fellay Martina, Program Manager, Austria, 2012
François Foglia, Deputy Director, Switzerland, Saxon, 2006
Edward-Lee Gregg, Financial Manager, United States of America, 2004
Léonore Miauton, Program Manager Head, Switzerland, Chexbres, 2012
Sylvie Millius, Administrative Assistant, Switzerland, Vétroz, 1996
Yann Rodriguez, Industrial Relations, Suisse, Vollèges, 2006
Nadine Rousseau, Administrative Assistant, Switzerland, Saxon, 1998

System Engineers

Bastien Crettol, System Administrator, Switzerland, Sion, 2005
Norbert Crettol, System Administrator, Switzerland, Martigny, 2002
Cédric Dufour, System Administrator, Switzerland, Verbier, 2007
Frank Formaz, System Manager, Switzerland, Fully, 1998
Louis-Marie Plumel, System Administrator, France, 2011
Vincent Spano, Webmaster, Switzerland, Martigny-Combe, 2004

Interns

First name and last name, country of origin, home institution

Idiap interns generally spend between six and ten months at the research institute. Some are students at the Ecole polytechnique fédérale de Lausanne (EPFL) and spend time at Idiap as part of their degree studies. Others come on student exchange programs set up with European projects in which Idiap participates.

Krysten Ansermoz, Switzerland, EPFL, Lausanne
Umut Avci, Turkey, University of Trento (ITA)
Julia Biolley-Franzetti, Switzerland, University of Lausanne
Lisa Bornet, Switzerland, HES-SO, Sierre
Maxime Bourlard, Switzerland, University of Neuchâtel
Fabian Brix, Germany, EPFL, Lausanne
Aleksandra Cerekovic, Croatia, University of Zagreb (HRV)
Gilberto Chavez Martinez, Mexico, CIMAT (MEX)
Joane Cheseaux, Switzerland, University of Geneva
Lukas De Oliveira, Switzerland, EPFL, Lausanne
Ailbhe Finnerty, Ireland, University of Trento (ITA)
Manon Fournier, Switzerland, University of Geneva
Catherine Gasnier, France, EPFL, Lausanne
Branislav, Gerazov, Macedonia, University of Skopje, (MKD)
Serife Kucur, Turkey, EPFL, Lausanne
Cesar Laurent, Switzerland, EPFL, Lausanne
Matthieu Mabillard, Switzerland, Migros Valais
Navid Mahmoudian, Iran, University Amvikabir (IRN)
Alvaro Marcos, Spain, University of Alcala (ESP)
Lesly Miculicich, Peru, University of Fribourg
Loris Millius, Switzerland, Collège La Planta, Sion
Thanh Trung Phan, Vietnam, Telecom, Paris (FRA)
Guillem Quer, Switzerland, Computer Programmer Independent, Barcelona (ESP)
Sandrine Revaz, Switzerland, University of Fribourg
Dairazalia Sanchez, Mexico, University Ensenada of Baja California (MEX)
Alexandre Sierro, Switzerland, HES-SO
Kelly Tiraboschi, Italy, University of Lausanne
José Velasco, Spain, University of Alcala (ESP)
David Yambay, USA, University of Clarkson, NY (USA)

Visitors

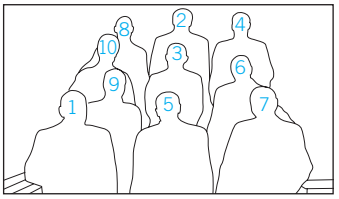
First name and last name, country of origin, home institution

Visitors are researchers or industry representatives who only spend a few days or weeks at the institute, some to strengthen inter-institutional relationships and others to get an insight into the work carried out at Idiap.

Srinivas Narayanan, Invited Professor, University of California, Berkeley, CA (USA)
Pierre Lison, Belgium, University of Oslo (NOR)
Shogo Okada, Japan, Institute of Technology, Tokyo (JPN)
Salvador Ruiz Correa, Mexico, CIMAT (MEX)

FOUNDATION COUNCIL 2014

The Foundation council is responsible for the economic and financial management of Idiap. It defines the institute's structure, appoints its director, and—more generally—ensures Idiap's development and defends its interests.



1 **Mr. Olivier Dumas**, President
Independent manager and business consultant

Mr. Jean-Daniel Antille, Vice-President *(not pictured)*
Manager of the Regional Office for the Economic Development of French-Speaking Valais

2 **Prof. Karl Aberer**, Vice-President
Vice-President for Information Systems,
Ecole polytechnique fédérale de Lausanne (EPFL)

3 **Mr. Marc-André Berclaz**
Operational Director of the EPFL Valais Wallis Outpost

4 **Mr. Stefan Bumann**
Head of the Service des Hautes Ecoles (SHE), State of Valais

Mr. Marc-Henri Favre *(not pictured)*
President of the city of Martigny

5 **Prof. Christian Pellegrini**
Senior Member of the Foundation Council of Idiap
Honorary Professor in the Faculty of Sciences
at the University of Geneva

6 **Mr. Jean-René Germanier**
Member of the National Council

7 **Mr. Patrick Furrer**
Vice-Chancellor Research and Innovation, HES-SO

8 **Mr. Jordi Montserrat**
Regional Manager Venturelab

Mr. Dominique Perruchoud *(not pictured)*
President of the Board of Cimark SA

Mr. Walter Steinlin *(not pictured)*
Swisscom University Relations
President of the Commission for Technology and Innovation (CTI)

Not members of the Foundation Council

9 **Prof. Hervé Bourlard**
Director of Idiap

10 **Mr. François Foglia**
Deputy Director of Idiap

ADVISORY BOARD

The Advisory Board is comprised of members of the scientific community selected by Idiap's management for their exceptional skills and avant-garde vision. Although their role is strictly advisory, their counsel is frequently sought and proves to be invaluable when making decisions regarding research, training, and technology transfer.

Dr. Jordan Cohen
Independent Consultant, Spelamode
Half Moon Bay, CA, USA

Prof. Anil K. Jain
Distinguished Professor, Department of Computer Science & Engineering
Michigan State University, USA

Dr. John Makhoul
Chief Scientist, Speech and Signal Processing, BBN Technologies
Cambridge, MA, USA

Prof. Kenji Mase
Professor, Graduate School of Information Science
Nagoya University, Japan

Prof. Nelson Morgan
Deputy Director (and former Director) of the International Computer Science Institute (ICSI)
Berkeley, CA, USA

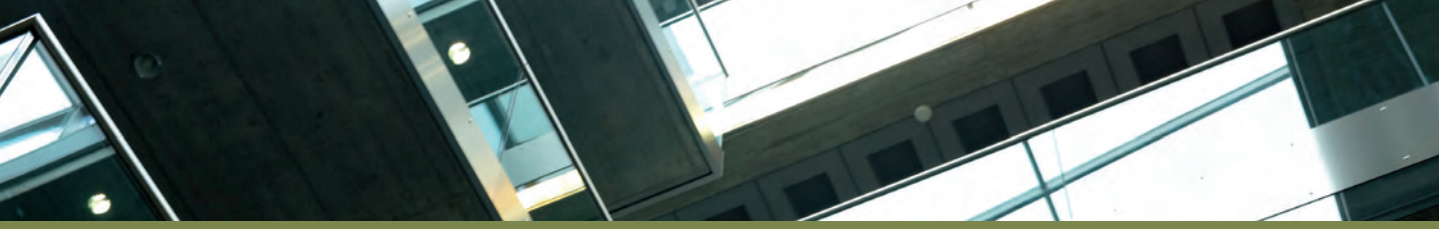
Prof. Klaus-Robert Müller
Professor of Computer Science, TU Berlin
Director, Bernstein Focus on Neurotechnology,
Berlin, Germany

Dr. David Nahamoo
Senior Manager, Human Language Technologies, IBM Research
Yorktown Heights, NY, USA

Prof. Gerhard Sagerer
Rector, University of Bielefeld,
Bielefeld. Germany

Prof. Bernt Schiele
Max-Planck-Director, MPI Informatics
Professor at Saarland University,
Saarbrücken, Germany

Prof. Bayya Yegnanarayana
Professor and Microsoft Chair, International Institute of Information Technology
Hyderababd, India



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