

IM2 Newsletter

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News

Steering Committee



Prof. Jacques Pasquier, new vice-rector (March 2007) of the University of Fribourg, takes the place of Prof. Vergauwen, promoted rector of the same university, in the IM2 Steering Committee.

<http://diuf.unifr.ch/people/pasquiej/>

Cover Story

A major event: the IM2 Winter Institute 2007

MURTEN/MORAT, 19-22 FEBRUARY 2007, LOEWENBERG CENTRE

Once again, the IM2 NCCR joins all the scientists active in IM2. After three previous and successful events in Martigny, Montana and Lausanne, the IM2 Winter Institute 2007 will take place at the Loewenberg Centre, Murten/Morat, February 19-22.

This year, the main goals of major IM2 event is to gather all the IM2 partners for a few days and give them a chance to meet and exchange experience around tutorials given by IM2 seniors. In addition, the program of the week features two poster sessions and an interesting workshop (organized by Venturelab) for those who want to learn the essentials about innovation and entrepreneurship: where to start and how to move forward. In this framework, Yann Guyonvarc'h, successful entrepreneur and former President and CEO of ViosoWave SA, will give a talk about his own experience.

In parallel to this major event, the IM2 Technical Committee and Steering Committee will also meet to discuss the scientific and strategic aspects of the IM2 NCCR.

IM2 Winter Institute Overview of the program

Monday 19.02.07	Tuesday 20.02.07	Wednesday 21.02.07	Thursday 22.02.07
	8:15-11:30 Tutorial HMI D. Lalanne (UniFr) E. Bertini (UniFr) Tutorial DMA-MCA-ISD A. Popescu-Belis (UniGe)	8:15-9:15 Tutorial HMI D. Lalanne (UniFr) E. Bertini (UniFr) 9:15-10:15 IM2 Overview Prof. H. Bourlard Director (IDIAP)	8:15-12:20 Tutorial VP L. van Gool (ETHZ) Tutorial MCA S. Marchand-Maillet (UniGe) A. Vinciarelli (IDIAP)
	11:30-12:30 12:30-13:15 Lunch	10:15-12h30 Poster Session 12:30-13:30 Lunch	12:20-12:40 Closing of Winter Institute 2007 Prof. H. Bourlard Director (IDIAP)
14:00-14:15 Welcome to Winter Institute 2007	13:15-15:30 Poster Session 16:00-18:00 Tutorial DMA-MCA-ISD S. Marchand-Maillet (UniGe) M. Flynn (IDIAP)	13:30-15:30 Tutorial VP S. Marcel (IDIAP) J.-Ph. Thiran (EPFL) 16:00-19:00 Outdoor Activities	12:40-13:30 Lunch
14:15-17:00 Tutorial AP J. Hennebert (UniFr)			
17:00-18:00 Setup Poster Session			
18:00-19:30 Dinner	18:00-19:30 Dinner	19:00-19:30 Dinner	

The full program is available from the IM2 Website

Excerpt from the 5th NCCR IM2 Review Panel Report

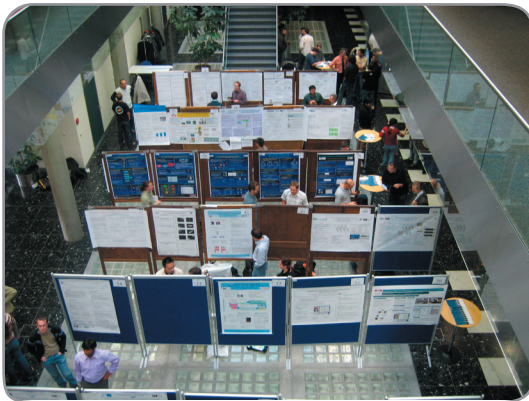
Chaired by Prof. Angelika Steger, ETH Zürich, the IM2 Review Panel met in Martigny last November to assess the fifth annual progress report. We quote here some of their conclusions:

Start of second phase and reaction to the outcome of the last review

The NCCR has been very responsive to last year's recommendations, especially with respect to the organisation of the IPs. Presentations by the IP leaders at the site visit were well organised and gave a good insight in the state of the work.

The Review Panel thinks that the individual projects (IPs) are coherent and well connected with the overall IM2 topic.

The annotated meeting database should be supplemented with queries and technology developed to demonstrate the ability to answer user requests for information in the current and earlier meetings. Positive steps have been taken in the Browser Evaluation Test (BET), but they are still insufficient.



IM2 Site Visit : Poster Session

Generally the Panel likes the new management structure although there are still some open questions. The Technical Committee meets once a month and appears to work well inside the IPs; but the experts would like to see evidence that it also works well across the IPs.

The NCCR used to have a Scientific Advisory Board in phase I which is not active any more for the time being. The Panel suggests reviving a strong working advisory board. It should help setting the technical direction and meeting the NCCR goals for IM2. Furthermore it could bring in outside perspective and be an advocate for the network.

Objectives were given for all IPs, but actual performance reporting was sparse so far. Every IP should be measured in view of its own objectives. Addressing this should not be onerous; an overview section in each IP section describing key results on metrics / tasks of interest should suffice.

In reaction to the recommendation to pilot an additional application vision well before the end of phase II the NCCR organized a two-day brainstorming workshop in September 2006. As concrete plans are still not apparent, the Panel insists that this issue still is a priority. The Panel rephrases its recommendation in a more open

way to offer more flexibility to IM2: The Smart Meeting Room application should be radically enhanced so as to make it clear that it will serve as an active research area for a fairly long period of time or a second application should be identified.

The Panel appreciates the effort to attract female researchers but regrets that the number of female employees has slightly diminished from the past year. Senior female researchers who are claimed to be part of IM2 in the report or presentation should indeed play a role within the research activities of IM2

Progress since last review

The presentations by the IP leaders and the discussions with students at the poster session showed that very good work is done within the framework of IM2.

The projects IM2.AP (Audio processing) and IM2.VP (Visual/Video processing) continued to do excellent internationally recognized research.

The Panel is pleased to see that IM2.DMA (Database management and meeting analysis) does a strong effort to solve the complex problems related to this topic.

IM2.MPR (Multimodal processing and recognition) and IM2.MCA (Multimodal content abstraction) have started showing good progress in multi-modal processing. The incorporation of social rules in annotation as suggested by Prof. Bourlard in his overview presentation looks promising. The Panel encourages the researchers to follow up this idea.

The efforts in IM2.HMI (Human-machine interaction) and IM2.ISD (Integration software and research demonstrators) are a good start for further activities.

Education and training efforts

The examples of first career continuations of former IM2 students show that they are offered interesting positions in research as well as in industry.

The alignment of IDIAP students with the EPFL Doctoral School is a commendable achievement. More professor level researchers should supervise and direct the Ph.D. students. The Panel assumes that "professor level researchers" at the IM2 affiliated institutions are allowed the usual autonomy and independence needed to direct student and postdoctoral research.

The poster and demo quality at the site visit was good and the Panel would like to have a poster and demo session again next year. They are interested mostly in IM2 posters.

Members of the Review Panel

Prof. Angelika Steger (Chair), SNSF
Dr. Giordano Bruno Beretta, Hewlett-Packard
Dr. Bill Byrne, Cambridge University
Prof. Shih-Fu Chang, Columbia University
Prof. Tat-Seng Chua, National University of Singapore
Prof. Béat Hirsbrunner, Université de Fribourg, SNSF
Prof. Ramesh Jain, University of California, Irvine
Prof. Helen Mei-Ling Meng, the Chinese University of Hong Kong
Prof. Claudia Opitz-Belakhal, Universität Basel, SNSF

Agnes Just and Yann Rodriguez have completed their doctoral degree in the framework of IM2

Funded by IM2, Agnes and Yann's work, under the supervision of Dr Sébastien Marcel, focused respectively on hand gesture recognition and face detection/verification. Yann was also co-supervised by Dr Samy Bengio.

The thesis of Agnes, entitled "Two-Handed Gestures for Human-Computer Interaction", is concerned with the development and evaluation (in terms of accuracy and utility) of systems using hand postures and hand gestures for enhanced Human-Computer Interaction (HCI). In our case, these systems are based on vision techniques, thus only requiring cameras, and no other specific sensors or devices.



From left to right: Yann Rodriguez, Sébastien Marcel, Agnès Just

When dealing with hand movements, it is necessary to distinguish two aspects of these hand movements: the static aspect and the dynamic aspect. The static aspect is characterized by a pose or configuration of the hand in an image and is related to the Hand

Posture Recognition (HPR) problem. The dynamic aspect is defined either by the trajectory of the hand, or by a series of hand postures in a sequence of images. This second aspect is related to the Hand Gesture Recognition (HGR) task. Given the recognized lack of common evaluation databases in the HGR field, a first contribution of this thesis was the collection and public distribution of two databases, containing both one- and two-handed gestures, which part of the results reported here will be based upon. On these databases, we compare two state-of-the-art models for the task of HGR. As a second contribution, we propose a HPR technique based on a new feature extraction. This method has the advantage of being faster than conventional methods while yielding good performances. In addition, we provide comparison results of this method with other state-of-the-art technique. Finally, the most important contribution of this thesis lies in the thorough study of the state-of-the-art not only in HGR and HPR but also more generally in the field of HCI.

In his thesis, entitled "Face Detection and Verification using Local Binary Patterns", Yann Rodriguez proposes a robust Automatic Face Verification (AFV) system using Local Binary Patterns (LBP). AFV is mainly composed of two modules: Face Detection (FD) and Face Verification (FV). The purpose of FD is to determine whether there are any face in an image, while FV involves confirming or denying the identity claimed by a person. The contributions of this thesis are the following: 1) a real-time multiview FD system which is robust to illumination and partial occlusion, 2) a FV system based on the adaptation of LBP features, 3) an extensive study of the performance evaluation of FD algorithms and in particular the effect of FD errors on FV performance.

BioLogin: New success



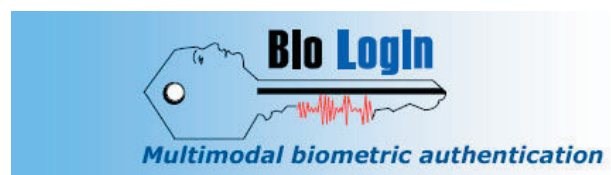
As announced in previous IM2 newsletters, IDIAP biometric authentication system, called «BioLogin» was awarded the Swiss Technology Award 2006 and invited by OSEC (Swiss Office for Commercial Expansion) to be demonstrated as part of the Swiss Pavillon at the CeBIT in Hannover, 2006.

At the end of December, IMD, the famous business school located in Lausanne and ranked 2nd in the world for its MBA program, announced the winners of their 9th annual Startup Competition. According to Jim Pulcrano and Benoit Leleux from IMD, which had to choose the best ventures from, well over 70, the overall quality was the best they have ever seen. Among the selected ventures, "BioLogin" makes a new success.

The BioLogin Team composed of Y. Rodriguez, J.Mariéthoz, S.Marcel, F.Crittin, F.Foglia, will have a unique opportunity to benefit from the help and insights of experienced IMD participants. BioLogin will work with the IMD 2007 MBA promotion (starting in January 2007), a group of high calibre, experienced and very

international students, a large proportion of which already have significant exposure to start-ups and new ventures.

BioLogin can expect to receive the dedicated support of a team of 5-6 IMD MBAs for a period of up to 6 months, under the supervision of an IMD Faculty member. The team would normally put an average of 6 hours on the project each week, with an afternoon in their schedule blocked for that purpose, for a total support package equivalent to at least 500-600 man-hours. The support team will allow "BioLogin" to develop its business plan to a point where it can be presented to funding sources.



Partner News

ETHZ business idea on TV

The business idea of two Computer Vision Laboratory researchers at ETH Zurich has been selected for the joint Docu-Series of the Swiss national TV and CTI 'Start-up - the road to your own company'. From initially more than 900 submissions, the number of remaining dossiers has already been reduced to a mere 12. Candidates had to present their ideas to a jury of experts. Among the 'survivors' are Herbert Bay and Till Quack, who presented ETH technology for visual recognition on mobile phones. The actual broadcasts start on 16. April on SF1 (mondays at 22:30). Having gotten that far is already a success per se, but if our candidates go to the next round, their start-up 'Kooaba' will get professional coaching and may even reach the final stage where its founders would be given the chance to convince potential investors.

Awards

IDIAP 2006 PhD student awards

The IDIAP internal research commission bestowed two awards recognizing the best PhD students at the Institute. One was conferred for the quality of research and the other for the best publication of the year.

- **Guillaume Lathoud** received the IDIAP Research Award on the basis of the following five criteria: publications, collaboration, involvement in projects, ability and readiness to communicate and autonomy.
- **David Grangier & Florent Monay** received the IDIAP Publication Award for «A Discriminative Approach for the Retrieval of Images from Text Queries » D. Grangier, F. Monay, and S. Bengio in «European Conference on Machine Learning (ECML)», 2006.

Daniel Roth receives the PST 2006 Best Paper Award

Torsten Spindler, Daniel Roth, Christoph Wartmann and Andreas Steffen received a best paper award for their article entitled «Privacy in Video Surveilled Areas», published at the International Conference on Privacy and Trust (PST 2006). In this paper, the authors present a system prototype for self-determination and privacy enhancement in video surveilled areas by integrating computer vision and cryptographic techniques into networked building automation systems. Work on this paper was made possible due to the involvement of Daniel Roth (BIWI/ETHZ) in the IM2.VP project.

Privacy in Video Surveilled Areas

T. Spindler, Ch. Wartmann, D. Roth, A. Steffen, L. Hovestadt and L. Van Gool
International Conference on Privacy, Security and Trust (PST 2006), October 2006.

IM2 publications at ICASSP 2007

The 32nd ICASSP (IEEE International Conference on Acoustics, Speech, and Signal Processing) meeting, which is the world's largest and most comprehensive technical conference focused on signal processing and its applications, will be held at the Hawai'i Convention Center in Honolulu, April 15 - 20, 2007.

This year, ICASSP received 2912 paper submissions, out of which 1344 papers were accepted for presentation. Among them, an important number of IM2 partners' publications were selected, including:

A Bayesian Alternative to Gain Adaptation in Autoregressive Hidden Markov Models
Bertrand Mesot and David Barber (IDIAP)

Unsupervised Speech / Non-speech Detection for Automatic Speech Recognition in Meeting Rooms
Hari Krishna Maganti, Petr Motlicek, and Daniel Gatica-Perez (IDIAP)

An Acoustic Model Based on Kullback-Leibler Divergence for Posterior Features
Guillermo Aradilla and Jithendra Vepa and Herve Bourlard (IDIAP)

A Generalized dynamic composition algorithm of weighted finite state transducers for large vocabulary speech recognition
Octavian Cheng, John Dines and Mathew Magimai Doss (IDIAP)

Automatic Weighting for the Combination of TDOA and Acoustic Features in Speaker Diarization for Meetings
X. Anguera, C. Wooters, J. Pardo, and J. Hernando (ISCI)

Model Complexity Selection and Cross-validation EM Training for Robust Speaker Diarization
X. Anguera, T. Shinozaki, C. Wooters, J. Hernando (ICSI)

An Articulatory Feature-based Tandem Approach and Factored Observation Modeling
O. Cetin, A. Kantor, S. King, C. Bartels, M. Magimai-Doss, J. Frankel, and K. Livescu (ICSI)

Statistical Sentence Extraction for Information Distillation
D. Hakkani-Tür, G. Tur (ICSI)

Word-conditioned phone N-grams for speaker recognition
H. Lei, N. Mirghafori (ICSI)

Comparing Evaluation Metrics for Sentence Boundary Detection
Y. Liu and E. Shriberg (ICSI)

Manual Transcription of Conversational

Speech at the Articulatory Feature Level
K. Livescu, A. Bezman, N. Borges, L. Yung, O. Cetin, J. Frankel, S. King, M. Magimai-Doss, X. Chi, L. Lavoie (ICSI)

Articulatory Feature-based Methods for Acoustic and Audio-visual speech Recognition: Summary from the 2006 JHU Summer Workshop

K. Livescu, O. Cetin, M. Hasegawa-Johnson, S. King, C. Bartels, N. Borges, A. Kantor, P. Lal, L. Yung, A. Bezman, S. Dawson-Haggerty, B. Woods, J. Frankel, M. Magimai-Doss, K. Saenko (ICSI)

Entropy Based Classifier Combination for Sentence Segmentation

M. Magimai-Doss, D. Hakkani-Tur, O. Cetin, E. Shriberg, J. Fung, N. Mirghafori (ICSI)

Combining Discriminative Feature, Transform, and Model Training for Large Vocabulary Speech Recognition

J. Zheng, O. Cetin, Mei-yuh hwang, X. Lei, A. Stolcke, N. Morgan (ICSI)

Tracking atoms with articles for audio-visual source localization

G. Monaci, P. Vandergheynst, E. Maggio, A. Cavallaro (EPFL)

Modelling Spoken Signatures with Gaussian Mixture Models Adaptation

J. Hennebert, A. Humm and R. Ingold (UNIFR)

Selected publications

A Kernel Trick For Sequences Applied to Text-Independent Speaker Verification Systems

J. Mariethoz and S. Bengio (IDIAP)
Accepted for publication in Pattern Recognition

From Vocal to Multimodal Dialogue Management

M. Melichar, P. Cenek, M. Ailomaa, A. Lisowska and M. Rajman (EPFL)
International Conference on Multimodal Interfaces (ICMI 06), Banff, Canada, November 2-4, 2006

HMM-Based On-Line Recognition of Handwritten Whiteboard Notes

M. Liwicki and H. Bunke (UniBe)
In Proc. 10th Int. Workshop on Frontiers in Handwriting Recognition, 2006, pages 595-599

Off-line Writer Verification: A Comparison of a Hidden Markov Model (HMM) and a Gaussian Mixture Model (GMM) Based System

A. Schlappbach and H. Bunke (UniBe)
In Proc. 10th Int. Workshop on Frontiers in Handwriting Recognition, pages 275-280, 2006.