

# IM2 Newsletter

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## News

### IM2 SUMMER INSTITUTE

The IM2 Summer Institute, organized jointly with the NCCR of Affective Science, will take place September 1-3, 2008.

The location still needs to be defined.

## Excerpt from the 6<sup>th</sup> NCCR IM2 Review Panel Report

Chaired by Prof. Angelika Steger, ETH Zürich, and Prof. René Schwarzenbach, SNSF National Research Council, president of the NCCR division, the IM2 Review Panel met in Geneva mid-November to assess the sixth annual progress report. We quote here some of their conclusions:

### General impression and reaction to the outcome of the last review

The Review Panel acknowledges that this year's IM2 progress report is probably the best since the start of the NCCR. It is well-structured and concise. The report identifies more clearly than in the past, which work was done within the framework of the NCCR IM2 and which parts flew in from other activities.

The coherence and the connectedness of the Individual Projects (IPs) has improved in the new streamlined IM2. The IPs are making very obvious efforts to make the work multimodal. These efforts are visible across all the IPs, except possibly BMI.

The publication strategy has been improved. There are more joint papers by authors from different institutions. The report also shows clearly more emphasis on major multimedia journals and conferences.

The work presented at the site visit is of high quality and engaged with the state of the art in the field.



Generally the Review Panel is satisfied with the way the NCCR has taken up its recommendations of last year.

### Progress since last review (science and other aspects)

IM2.VP continued to do excellent internationally recognized research. IM2.AP is still a strong project but shows a perhaps slightly weaker publication record than in previous years. Good progress is being made in all other IM2 IPs.

The NCCR has taken up the challenge to move towards user centered systems. There seems to be more activity in Human Computer Interaction (HCI) design and evaluations; or at least it is now better visible for the panel members. Databases and effectiveness of BET and other strategies should continue to be studied, evaluated and developed.



The NCCR should design an information architecture for a complete system and demonstrate the information and processing flow from user requests to meeting data. The researchers should have in mind a clear set of user needs and goals.

Previous recommendations concerned the re-establishment of the Advisory Board and restructuring of the Steering Committee. The panel endorses the measures taken by IM2 in this respect. The new Advisory Board is in place and the members of the Steering Committee seem to have a clearer idea of their role with respect to the long-term scientific direction of IM2.

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Cover Story

www.im2.ch

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## Excerpt from the 6<sup>th</sup> NCCR IM2 Review Panel Report

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The funding reduction for the years 7 (-20%) and 8 (-40%) forced the NCCR to reshuffle the budget allocations. The panel thinks that IM2 responded adequately to this difficult challenge. The projects with a mono-modal focus were cut more than the ones with more multi-modal aspects. The merging of the project about Integration and Software Demonstration (IM2.ISD) into the Database project (IM2.DMA) seems to be a good choice. The project IM2.BMI (Brain Machine Interfaces) remains an issue, particularly with reduced funding.

### Recommendations

- IM2 has been responsive to previous recommendations to expanding the scope of databases in remote meetings, conferences, and seminars. The work should now focus on consolidating collected data and annotation, and on defining user-centric tasks.
- IM2 should continue to focus on multi-modal research, especially on the scientific aspects of fusion frameworks.
- Development of interfaces and supporting technology for storage/browsing systems should be done with a view to compatibility and consistency with established standards.

The full report is available on the IM2 Intranet Website (*Administrative section*). [www.im2.ch/intranet](http://www.im2.ch/intranet)

### 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

### Invited

Prof. René Schwarzenbach, president of the NCCR division, SNSF

## Multimedia Signal Processing Group of EPFL starts its involvement in IM2

The Multimedia Signal Processing Group of EPFL, headed by Prof. Touradj Ebrahimi, IM2 Deputy Director, is now fully involved in IM2 in the context of IM2.MCA. Two Ph.D. students, Mrs Francesca De Simone and Maija Uscumlic, are directly involved in IM2, together with Senior Researchers Dr. Frédéric Dufaux, Dr. Michael Ansorge and Dr. Thien Ha Minh.



The team is composed of 15 researchers and is active in research and teaching in the field of multimedia signal processing. Research topics span over three highly interconnected disciplines of multimedia signal processing,

namely multimedia coding, multimodal processing, analysis and interpretation, and media security. Multimedia coding includes still image, video and 3D model compression. Multimodal processing, analysis and interpretation deal with image and video analysis for interpretation, such as change detection, feature point extraction and tracking, object segmentation and tracking, compressed domain processing, metrics for quality of experience, and signal processing issues in man-machine interface for interactive communication. Media security includes development of algorithms for copyright protection, conditional access and authentication of images, video and 3D models. In addition, the group is very active in a number of international collaborations such as those within the European Commission Research Frameworks as well as MPEG and JPEG standardization efforts, where it contributes both at technical and leadership levels. More information about the activities of the group can be found at: <http://mmspl.epfl.ch>

### IM2.MCA (A2) Tagged media-aware multimodal content annotation

In this project, starting from the investigation of existing approaches for multimedia content access, we focus on finding new models of interaction between automatic multimedia content analysis and social tagging. When users in a social network annotate and rate multimedia content, they provide objective cognitive information and subjective opinions at

a level that cannot typically be handled by multimedia content analysis. The goal of this project is to examine the technological components of the new value chains in networked media associated with social networking concepts. The project is expected to be a key contributor to the JPSearch standardization effort, a standard for interoperability in image search and retrieval systems.

Marija Uscumlic received the Dipl. Ing. Degree from the Faculty of Electrical Engineering, University of Belgrade in 2005. Her research interests include image segmentation and feature extraction, neural network applications in image processing, multifractal image analysis and linear and non-linear biomedical signal processing. She joined the Multimedia Signal Processing Group at EPFL in January 2008.



### IM2.MCA (B2) Multimodal quality metrics for multimedia content abstraction

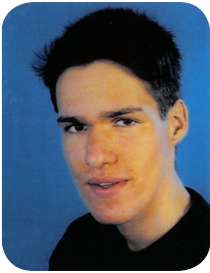
Measurement of perceived quality plays a fundamental role in the context of multimedia services and applications. In this project, starting from the investigation of existing approaches for the objective quality assessment of audio and visual contents, we focus on No-Reference scenario, aiming at developing a new approach of NR objective quality assessment which integrates high-level features of human perception. An important part of this research concentrates on the understanding and modeling of the multimodal perception of quality, in order to design a metric for the assessment of the more complex concept of Quality of Experience in a multimedia context.



Francesca De Simone received her M.Sc. in Electronic Engineering from Università degli Studi Roma TRE, Rome, Italy, in December 2006. Since May 2007 she is research assistant in the Multimedia Signal Processing Group at EPFL. Her research interests include multimedia human perception models and subjective and objective quality assessment of multimedia contents. She is currently involved in IM2, K-SPACE and

VISNET II networks of excellence and in the CTI A-VISION project.

## Marcus Liwicki and Andreas Schlapbach have completed their doctoral degree in the Framework of IM2



Dr. Marcus Liwicki successfully defended his PhD thesis entitled «Handwriting Recognition of Whiteboard Notes - On-Line, Off-Line and Combination» on November 1st 2007 with best grade (6). He has been working on developing recognizers for the White Board in the IM2 Smart Meeting Room. During the work on his PhD he first reached a word recognition accuracy of about 55% using an off-line recognition system previously developed at the University of Bern. By developing an on-line recognizer and

combining these systems with commercial recognizers, he could finally achieve a performance of more than 86% on the same test set under the same conditions. Dr. Marcus Liwicki received the «IAM Alumni Award» for the best thesis in computer science at the University of Bern in 2007. An extended version of the PhD thesis will be published in the form of a book in the series on «Machine Perception & Artificial Intelligence» by World Scientific. (University of Bern, Prof. Horst Bunke, IM2.VP)



Dr. Andreas Schlapbach successfully defended his PhD thesis entitled «Writer Identification and Verification» on November 22 2007 with best grade (6). The thesis addresses both off-line as well as on-line handwriting data. In the off-line case, two state-of-the-art systems to address the tasks of writer identification and verification using HMMs and GMMs to model a person's handwriting are developed and evaluated. For the on-line case, a GMM-based system to identify the writer of on-line handwritten notes on a whiteboard is

presented. Furthermore, feature selection methods are applied to improve the performance of an existing writer identification system. This work is an important contribution towards the IM2 Smart Meeting Room in the sense that it allows to identify the writer of a handwritten text on the whiteboard automatically. The PhD thesis will be published in the form of a book in the series «Dissertationen zur Künstlichen Intelligenz» by Aka GmbH. (University of Bern, Prof. Horst Bunke, IM2.VP)

## 2008 startup competition winners (Two IM2 startups selected)

By Jim Pulcrano, Director Switzerland and member of the EMBA teaching team



As someone who follows technology startups for a living, I'm constantly surprised and pleased by the innovations that come out of a place like Silicon Valley. Some of them are perplexing products that for the life of me I can't figure out who would use them. Others I simply can't understand. But then there are the many others that are truly inspirational. Ideas, that when you see them proposed as products, just make perfect sense. You

ask yourself, «Why didn't I think of that?», or, «I would buy that!», or, «I hope they're successful, because we need that badly».

I'm pleased to say that this year we've seen more of the inspirational variety in the 10<sup>th</sup> annual IMD Startup Competition winners (and these are mostly Swiss startups). Benoit Leleux, MBA Program Director and I had the luxury of choice this year. We had many more great regional startups to choose from than we had slots for in the MBA and EMBA programs. The support from venture capitalists, IMD alumni, the CTI/KTI and Venture Lab programs of the Swiss Government, as well as the two Swiss Federal Institutes of Technology (EPFL and ETH), IDIAP and past winners of the startup competition brought us a plethora of companies to match up with our MBA and EMBA teams this year.

### Winners of the IMD Startup Competition

#### Executive MBA Program

Kooaba (IM2 start-up, ETHZ), Klewel (IM2 start-up, IDIAP), Diagnoplex, EpiSpeed, NovaShunt, routeRANK, shiftTHINK

#### Fulltime MBA program

BioApply, Delta Robotics, deskNET, Doodle, HealthOne, CrazyLazy, Lighthouse Information Technologies, miniswys, Mnemis, picoDrill, Poken, Quantesys, Skimondo, Sonosax, yXo

All these companies will work with our MBA and EMBA students in 2008, and hopefully everyone will profit. IMD believes that all executives can benefit from better understanding the mindset of the entrepreneur, whether it's in devising strategy in an unknown market, working with a team of brilliant technologists or executing fast with minimal resources. As Benoit Leleux said, «Working with startups forces the students to solve problems that don't fit with the many nice frameworks and models that they learn in the MBA or that they acquired in the corporate world».

### Two IM2 start-ups selected for the Executive MBA Program

On 17<sup>th</sup> January, IMD, the famous business school located in Lausanne and ranked 2<sup>nd</sup> in the world for its MBA program (read above), announced the winners of their 10<sup>th</sup> annual Startup Competition.

A jury has selected the ETHZ spin-off Kooaba and the IDIAP start-up Klewel as two of the 10 winners of Venture 2008.



#### Kooaba

Kooaba is a joint initiative of the ETH domain and McKinsey. Kooaba is at the forefront of the 'Internet of Things', making real-world objects 'clickable': taking a picture with your mobile phone suffices to get more information downloaded. 'Work under the IM2 project has been crucial to build the technological baseline for the company', says Till Quack, CTO of Kooaba.

#### Klewel

Tremendous amounts of knowledge are shared everyday through oral presentations. However, the biggest part of such an invaluable asset is irremediably lost in absence of effective technologies for knowledge management. Klewel Sàrl, founded in November 2007 by Maël Guillemot, Alessandro Vinciarelli and Jean-Marc Odohez, provides leading edge solutions for effectively capturing, archiving and searching the information contained in multimedia digital recordings of presentations and conferences. The technology at the core of the Klewel services has been developed in the framework of the IM2 project. Klewel's target market consists in workshops and meeting organizers in all kinds of domains ranging from banking to e-learning, held in congress centers, and seminar hotels. Switzerland hosts many events promoted by international institutions that represents a major business opportunities.



Kooaba and Klewel can expect to receive the dedicated support of an Executive MBA team for a period of up to 6 months, under the supervision of an IMD Faculty member. The support team will allow the two IM2 Start-ups to develop its business plan to a point where it can be presented to funding sources in Silicon Valley next September 2008.

## Upcoming Events



### MLMI 2008 - Call for papers

The fifth Joint Workshop on Machine Learning and Multimodal Interaction (MLMI 2008) will be held in Utrecht, The Netherlands, following successful workshops in Martigny (2004), Edinburgh (2005), Washington (2006) and Brno (2007).

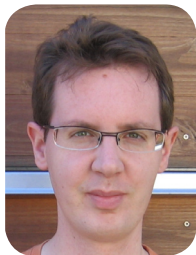
#### Important dates

- Submission of papers/posters: 31 March 2008
- Acceptance notifications: 12 May 2008
- Camera-ready versions of papers: 16 June 2008
- Workshop: 8-10 September 2008

Prospective authors are invited to submit proposals in the domain of machine learning and multimodal interaction. Detailed instructions are available on the workshop website at <http://www.mlmi.info>. The workshop proceedings will be published in Springer's LNCS series, and will be available at the workshop.

## Partner News

### IM2 postdoc receives a special mention for his PhD



Xavier Naturel, a former graduate student at INRIA, France, employee at IDIAP as an IM2 postdoc, received a special mention of the Research Prize Inattheque de France 2007, for his thesis entitled «Automatic Structuring of TV Video

Streams». Traditionally dedicated to favor reflexion on the social and political influence of television, this is the first time that a technical work is being rewarded.

The research prize of Inattheque de France has been created in 1997 to encourage a critic knowledge of radio and television, and develop reflexion on these two medias. Inattheque de France manages the legal deposit at INA, and welcomes researchers and students who need access to the INA archives for their research.

INA is the repository of all French radio and television audiovisual archives. Its archives are worth more than 70 years of audiovisual material. This is the biggest repository of audio visual data in the world.

## Awards

### EPFL

We had a best paper distinction for a joint IM2 paper (EPFL Billard / EPFL Thiran), presented at CORES'07.

Analysis of head-mounted wireless camera videos for early diagnosis of autism

The Authors of the paper are: Basilio Noris<sup>1</sup>, Karim Benmachiche<sup>1</sup>, Julien Meynet<sup>2</sup>, Jean-Philippe Thiran<sup>2</sup> and Aude G. Billard<sup>1</sup>.

- 1 École Polytechnique Fédérale de Lausanne, Learning Algorithms and Systems Laboratory, Lausanne, Switzerland,
- 2 École Polytechnique Fédérale de Lausanne, Signal Processing Institute, Lausanne, Switzerland

### ETHZ

Work on body pose analysis by ETHZ has been awarded the Tsuji Outstanding Paper Award at the Asian Conf. on Computer Vision 2008 (ACCV). This was one of the 3 Best Paper awards. The prize was given to the paper «Learning Generative Models for Monocular Body Pose Estimation» by Tobias Jaeggli, Esther Koller-Meier, and Luc Van Gool

## Selected publications

Calibration-Free Eye Gaze Direction Detection with Gaussian Processes.

*B. Noris, K. Benmachiche, and A. Billard*

In Proceedings of the International Conference on Computer Vision Theory and Applications. In Press, 2008

Analysis of Head Mounted Wireless Camera Videos for Early Diagnosis of Autism.

*B. Noris, K. Benmachiche, J. Meynet, J-P. Thiran, and A. Billard*

In Proceedings of the International Conference on Recognition Systems. Was awarded a best paper presentation distinction to Basilio Noris, 2007

Multi-Activity Tracking in LLE Body Pose Space

*T. Jaeggli, E. Koller-Meier, and L. Van Gool*

2<sup>nd</sup> Workshop on HUMAN MOTION Understanding, Modeling, Capture and Animation, ICCV, October 2007

Event-Based Tracking Evaluation Metric

*D. Roth, E. Koller-Meier, D. Rowe, T.B. Moeslund and L. Van Gool*

IEEE Workshop on Motion and Video Computing (WMVC), January 2008, in press

Multi-party Focus of Attention Recognition in Meetings from Head Pose and Multimodal Contextual Cues

*S. Ba and J-M. Odobez*

Accepted to ICASSP conference, Las-Vegas, April 2008

Feature Selection for On-Line Handwriting Recognition of Whiteboard Notes

*M. Liwicki, and H. Bunke*

Proc. 13<sup>th</sup> Conf. of the Int. Graphonomics Society, 2007, pp. 101-105

Automatic Detection of Gender and Handedness from On-Line Handwriting

*M. Liwicki, and A. Schlapbach, P. Loretan, and H. Bunke*

Proc. 13<sup>th</sup> Conf. of the Int. Graphonomics Society, 2007, pp 179-183

Spoken Signature For User Authentication

*A. Humm, J. Hennebert, and R. Ingold*

In SPIE Journal of Electronic Imaging, Special Section on Biometrics: ASUI, January-March 2008, Vol. 17, No. 1, accepted for publication

Credence estimation and error prediction in biometric identity verification

*K. Kryszczuk, and A. Drygajlo*

Signal Processing, November 2007

Clustered multidimensional scaling for exploration in information retrieval

*E. Szekely, E. Bruno and S. Marchand-Maillet*

In 1<sup>st</sup> International Conference on the Theory of Information Retrieval (ICTIR'07). Budapest, Hungary, 2007

Hierarchical Long-Term Learning for Automatic Image Annotation

*D. Morrison, S. Marchand-Maillet, and E. Bruno*

In Proceedings of 2<sup>nd</sup> International Conference on Semantic and Digital Media Technologies (SAMT), Genova, Italy, December 5-7 2007

Indexing and visualizing digital memories through personal email archive

*F. Evequoz, and D. Lalanne*

In proc. of Supporting Human Memory with Interactive Systems, Workshop at HCI 2007, Lancaster (UK) September 4, 2007, pp. 21-24

Personal information management through interactive visualizations

*F. Evequoz*

Talk given at Doctoral Colloquium InfoVis 2007, Sacramento, CA (USA), October-November 2007

Filter Bank Design Based on Minimization of Individual Aliasing Terms for Minimum Mutual Information Subband Adaptive Beamforming

*K. Kumatani, J. McDonough, S. Schacht, D. Klakow, P. Garner, and W. Li*

Proc. ICASSP, Las Vegas, Nevada, U.S.A., March - April, 2008

Integrating Several Annotation Layers for Statistical Information Distillation

*M. Levit, D. Hakkani-Tur, G. Tur, and D. Gillick*

IEEE workshop on Automatic Speech Recognition and Understanding (ASRU 07), Kyoto