

# IM2 Newsletter

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## News

### Site Visit of the IM2 Review Panel

November 12-13

**Venue**  
Martigny

#### Review Panel members:

Prof. Angelika Steger (Chair)  
Dr Giordano Bruno Beretta  
Dr Thomas Hofmann  
Prof. Shih-Fu Chang  
Prof. Tat-Seng Chua  
Prof. Béat Hirsbrunner  
Prof. Ramesh Jain  
Prof. Helen Mei-Ling Meng  
Prof. Claudia Opitz-Belakhal  
Prof. Yu-Jin Zhang

**Ildiap booth at the ICT 2008**  
**Europe's biggest research event**  
**for information and communication**  
**technologies**  
**November 25-27, 2008**  
**Lyon, France**

## IM2 Scientific Advisory Report

Utrecht, September 10, 2008

The IM2 Scientific Advisory Board (SAB) had a meeting with representatives of the IM2 consortium during MLMI on September 10, 2008 in Utrecht / The Netherlands.

The meeting started with an overview presentation of last year's IM2 review report and activities, given by the IM2 deputy director Prof. Ebrahimi, followed by three more technically oriented talks about user centric evaluation and multimodality (given by A. Popescu-Belis, S. Marchant-Maillet, and A. Billard), and finally by a presentation of the IM2 director H. Bourlard about the planning of the third IM2 phase, foreseen from 2010-2013. The meeting concluded with an extensive discussion between all participants and a private meeting of the SAB.

After the first presentation, participants discussed briefly the major outcome and consequences of the last IM2 review of November 2007 and the resulting report of the Review Panel. The SAB acknowledged that the feedback from the Review Panel was mostly positive and has confirmed that IM2 made good progress during the reporting period 2007.

A few critical remarks of the Review Panel were discussed in more detail. The SAB confirmed the statement of the IM2 directors, that – despite the fact that work in multimodal processing has been recently more emphasized as recommended by the Review Panel and supported by the SAB in its September 2007 meeting – work on unimodal processing remains to be important for the overall progress of IM2, since multimodal recognition can only work well and advance further, if the various single-modes are mastered sufficiently well and yield as low as possible error rates for established recognition tasks involving only one modality.

The fact that multimodal research is now one of the predominant research directions in IM2 has been demonstrated by the technical presentations during the meeting. The SAB also confirmed that the recommendations of the Review Panel's report have been taken carefully into account by the IM2 consortium. This

resulted into several adjustments to the different individual projects (IP) and to the IM2 management structure during the last year. One example is the expected decline in funding for IM2.BMI due to the possible transfer of that activity to a new chair at EPFL, another example is the fact that the new IP leaders are now more balanced among the various IM2 partners.

Then, the planning of the 3rd IM2 Phase has been presented. This phase is foreseen for the period from 2010-2013. A pre-proposal will be presented to SNF and the Review Panel by the end of 2008 and the planning of this pre-proposal has already reached a very active state. Very concrete plans for the new structure of Phase III have been presented during this meeting and were extensively commented by the SAB. It was agreed that major changes to the current structure of the IM2 research programme are absolutely necessary in order to maximize the chances for getting funded in this last phase of IM2. One reason for that is the fact that funding will be reduced to 50% of the Phase II funding with an option of further 15% for additional research activities in Phase III. Other reasons for the necessity of strong modifications include the fact that structural impact will be a major new issue in Phase III. The participants discussed the possible interpretations of the term "structural impact" and largely agreed that this is mainly imposed by the creation of new permanent high-level positions in conjunction between Ildiap and EPFL, but it was emphasized that structural impact could also be evoked by things such as technology transfer, creation of new institutes (such as the one on usability studies foreseen at the University of Fribourg) or creation of a network with a long lasting impact after the termination of funding for IM2.

Among the various options for the new structure of Phase III has been a very radical version which would have resulted into only two IPs proposed for this final phase, but the SAB is in agreement with the IM2 management that the proposed version, resulting into four different IPs is the preferable structure for Phase III.

*To be continued on page 2*

Cover Story

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## IM2 Scientific Advisory Board (continued)

There was no doubt that the first two planned IPs are well chosen, where the new IP1 basically continues the work on multimodal processing done so far in the various IPs of Phase II and the new IP2 is more concerned about new applications and their evaluation; a few suggestions were made to find a more suitable name for this IP.

The new IP3 will contain new research directions: its topic "Social Signal Processing" is well chosen, since this is indeed a significant emerging topic in the research community, in which IM2 researchers are already at the lead, and it is backed by the recommendations of the Review Panel. Furthermore, it is not a completely new research direction that would possibly introduce some "unsteadiness" in the research programme for the final phase, rather, it is a novel research line which is logically emerging from the research performed in IM2 during the last 8 years on meetings and human-to-human communication paradigms, which both directly imply the investigation of social interaction among people. This is where possibly new interdisciplinary partners could be incorporated into the IM2 consortium, which will probably have financial consequences for existing partners. However those should not be simply excluded from Phase III but rather encouraged to continue with probably reduced effort and funding via the established white paper scheme. The SAB agrees that this smooth transition to new partners will be important in order to demonstrate that IM2 is based on a trusted partnership that collaborated well in the first two phases.

The fourth large project in Phase III – although it is not yet clear if that should be officially named IP – will concentrate all efforts in the before mentioned area of structural impact and thus deal with related issues already mentioned, such as knowledge transfer, education, personnel structure, gender issues or networking, creation of a virtual institute with long-term impact on the research community in Switzerland and beyond. Some preliminary budget subdivision has been also discussed, where

one possible solution would be to devote a certain amount to this fourth IP, reserve the fixed amount of 15% for the third and then subdivide the remainder between IP1 and IP2, with the larger part for IP1, since research on multimodality should continue to be a major issue during the last phase of IM2.

### Conclusion

During the meeting, the Advisory Board was able to evaluate the work done over the past year. The IM2 team had taken into consideration previous remarks made by the Advisory Board and reviewers, strengthening some projects and leaving aside those projects whose theme was marginal to IM2. The emphasis on truly multimodal projects has been increased, and efforts in this area are paying dividends. The IM2 team has defined plans for the next period. Their aim is to continue to reinforce their work on multimodality, while also enlarging the project to pluridisciplinary researchers, as well as to create a virtual institute. The opening of the core research theme to further research specialisms gives a first reflection of the sustainable future of IM2.

### IM2 Scientific Advisory Board members

- Prof. Carol Peters, Italian National Research Council, Institute for Information Science and Technologies, Pisa, Italy (excused)
- Prof. Gerhard Rigoll, Technischen Universität München, Germany
- Prof. Steve Renals, University of Edinburgh, School of Informatics, Director of the Center for Speech Technology, Research, University of Edinburgh
- Prof. Sharon Oviatt, Adapx, Headquarters Adapx, 821 Second Avenue, Seattle, WA 98104 (excused)
- Prof. Catherine Pelachaud, Professor, IUT de Montreuil, Université de Paris 8, France

## New book published on Recognition of Whiteboard Notes

FROM THE UNIVERSITY OF BERN

An extension of the PhD-Thesis by Marcus Liwicki has been published by World Scientific in October 2008. It covers important aspects for the recognition of whiteboard notes in the context of smart meeting room systems. In the following, more detailed information is given:

**Title:** Recognition of Whiteboard Notes - Online, Offline and Combination

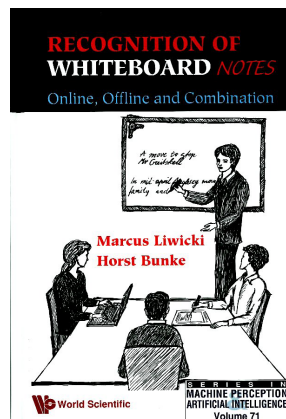
**Authors:** Marcus Liwicki and Horst Bunke

**Series:** Machine Perception and Artificial Intelligence

**Volume:** 71

This book addresses the issue of processing on-line handwritten notes acquired from an electronic whiteboard. Notes written on a whiteboard is a new modality in handwriting recognition research that has received relatively little attention in the past. The main motivation for this book is smart meeting room applications, where not only speech and video data of a meeting are recorded, but also notes written on a whiteboard are captured. The aim of a smart meeting room is to automate standard tasks usually performed by humans in a meeting. In order to allow for retrieval of the meeting data by means of a browser, semantic information needs to be extracted from the raw sensory data.

The main achievements of this book can be summarized as follows. A new on-line handwritten database has been compiled, and four handwriting recognition systems have been developed. These are off-line and on-line recognition systems, a system combining off-line and on-line data, and a writer-dependent recognition system. The on-line recognition system includes novel preprocessing and normalization strategies which



have been developed especially for whiteboard notes. A recently introduced classification strategy based on bidirectional long short-term memory networks has been applied for the first time in the field of handwriting recognition. During combination both the off-line and on-line system have been combined. To the best of the author's knowledge these are the first experiments in the field of on-line sentence recognition combining systems based on off-line and on-line features. Furthermore, external recognition systems have been included in the combination experiments. The experimental results on the test set show a highly significant improvement of the recognition performance. The optimal combination performs with more than 85%, implying a relative error reduction of about 25%, compared to the best individual classifier.

### Features of the book:

- Introduces the field of automatic handwriting recognition by computer. Addresses a relatively new task, which is the reading of notes written on a whiteboard; there are no competing books on this topic.
- Includes a description of several recognizers developed by the authors, as well as a brief introduction to two commercial recognition engines (by Microsoft and Vision Objects).
- Parts of the book are also accessible to non-experts, newcomers to the field, and students.

**Contact:** Marcus Liwicki, DFKI - German Research Center for Artificial Intelligence, [liwicki@dfki.uni-kl.de](mailto:liwicki@dfki.uni-kl.de)

## MLMI 2008 - 5<sup>th</sup> Workshop on Machine Learning and Multimodal Interaction

SEPTEMBER, 8-10, 2008, UTRECHT, THE NETHERLANDS

The 5<sup>th</sup> workshop on Machine Learning for Multimodal Interfaces took place in Utrecht, on September 8-10, the Program Chair being Andrei Popescu-Belis (Idiap) and several IM2 members serving on the Program Committee. The MLMI series of workshops is one of the key achievements of IM2 with respect to knowledge transfer to the research community. MLMI was launched by IM2 in 2004, and is now supported by IM2 and the AMI Consortium. The workshop has become a widely recognized forum in multimodal information processing and multimodal interfaces, with about 80 participants from a dozen countries at MLMI 2008. IM2 institutions were of course well represented, along with other institutions from Europe, the USA and Japan. The MLMI presentations were recorded using the Klewel Presentation Acquisition System (an IM2/Idiap spin-off), and are available on the IM2 MMM server.

MLMI 2008 has introduced a significant change which bears witness to the maturity of the series: the printed proceedings were prepared for the workshop (in agreement with Springer LNCS), unlike previous years, when a second round of reviewing was necessary to produce post-conference proceedings. The volume appeared in Springer's Lecture

Notes in Computer Science series, co-edited by the two program chairs, A. Popescu-Belis from Idiap and R. Stiefelhagen from the U. of Karlsruhe, a non-IM2 person to ensure diversity of representation. The proceedings of the past five MLMIs are, respectively, LNCS 3361, 3869, 4299, 4892, and 5237. The 2008 proceedings contain 12 regular papers (about 25% of all submissions), 15 papers for posters, and 5 papers for the special session.

Several other events have taken the opportunity to be collocated with MLMI 2008: the AMI Knowledge and KnowHow Transfer Day, a Dutch ASR evaluation workshop, an Interproject meeting on the evaluation of space-time audio processing, a Student Poster session, and a meeting of the IM2 Scientific and Advisory Board. Of particular interest to IM2 is the special session on «User requirements and evaluation of multimodal meeting assistants/browsers», organized on September 9 by A. Popescu-Belis (Idiap) and D. Lalanne (DIVA/UniFr), with W. Post (TNO, Delft) and S. Whittaker (U. of Sheffield). The five papers (published in the MLMI proceedings) introduced a large panel discussion, aimed as a synthesis of the work done in IM2 and AMIDA on user requirements, the conclusions of which are still being analyzed at the time of writing.

## IM2 Structural impact

STRATEGIC ALLIANCES & TENURE TRACK FACULTY OPEN POSITIONS

IM2 is still having a strong and visible structural impact. Based on its growing reputation, Idiap Research Institute is now recognized by SER (Federal Government) as part of a "strategic alliance with the EPF-ETH domain" (since January 2008). This came with a joint, Idiap-EPFL development plan (signed July 2008), involving common research activities, development of a common doctoral program and including the provision for several new joint EPFL/Idiap assistant professor tenure track positions. The full description of these open positions is available below:



### Joint Faculty Positions in Signal Processing at the Ecole polytechnique fédérale de Lausanne and the Idiap Research Institute



The School of Engineering at the Ecole Polytechnique Fédérale de Lausanne (EPFL) invites applications for several **tenure track faculty positions** conjointly with the affiliated Idiap Research Institute in Martigny. The main focus of this search is for junior positions, however, exceptionally well-qualified candidates may be considered at a more senior level.

We encourage candidates with a strong commitment to **novel theories and applications of signal processing**. Topics of interest include, but are not limited to: multimedia and communications; data mining; social network analysis; computational finance; environmental monitoring; biomedical imaging; bioinformatics and systems biology.

Evidence of strong research and teaching capabilities are expected. The successful candidates are expected to initiate independent, creative research programs at the Idiap Research Institute in collaboration with EPFL. As members of the EPFL faculty, they will participate in undergraduate and graduate teaching in Lausanne.

Significant start-up resources and research infrastructure will be available. Internationally competitive salaries and benefits are offered.

Applications should include a curriculum vitae with a list of publications, a concise statement of research and teaching interests, and the names and addresses (including e-mail) of at least five references. Applications should be uploaded to <http://sp-search.epfl.ch>. The deadline for applications is **31 January 2009**.

Enquiries may be addressed to:  
**Prof. Michael Unser**  
E-mail: [hiring.stisp@epfl.ch](mailto:hiring.stisp@epfl.ch)

For additional information on EPFL, the School of Engineering and the Idiap Research Institute, please consult the web sites <http://www.epfl.ch>, <http://sti.epfl.ch> and <http://www.idiap.ch>.

EPFL and Idiap aim to increase the presence of women within their institutions, and qualified female candidates are strongly encouraged to apply.

## News

### Nokia's Maemo Summit September 2008, Berlin, Germany

Nikos Tsourakis, a PhD student at ISSCO/TIM University of Geneva, had an invited presentation in the Nokia's First Maemo Summit on "Developing Multilingual Multimodal Applications in Maemo".

Maemo is an open source development platform for Nokia's Internet Tablets. In this event he had the opportunity to demonstrate a prototype mobile meeting calendar system which was deployed in the context of the IM2.HMI.

#### Contact:

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Université de Genève, ISSCO/TIM/ETI,  
[Nikolaos.Tsourakis@issco.unige.ch](mailto:Nikolaos.Tsourakis@issco.unige.ch)

### CH-F TIC Workshop September, 12, 2008

Idiap, in collaboration with the French Embassy in Switzerland organized a joint workshop between IM2 and MICS researchers on one hand and several French "Pôles de Compétitivités" on the other hand.

A "Pôle de Compétitivités" is a large network of companies and academic institutions whose aim is to promote and encourage collaborative research projects that will possibly be funded by the French Agency for Research (ANR). The French Embassy decided to invite several representative from those "Pôles" to meet researchers for Im2 and MICS to setup possible collaborations around common interests. Three of such "Pôles" were present at the meeting.

Involving about 30 people (during the talks) and 50 during the table discussions, the workshop was considered as a success, opening up multiple opportunities for future collaboration.

More information on the event is available from [http://www.idiap.ch/special\\_events.php](http://www.idiap.ch/special_events.php)

## Upcoming Events

### IM2 Site visit November, 12-13, 2008

Chaired by Prof. Angelika Steger, ETH Zürich, and Prof. René Schwarzenbach, SNSF National Research Council, president of the NCCR division, the IM2 Review Panel will meet in Martigny, November 12-13, to assess the seventh annual progress report and the IM2 pre-proposal Phase III (2010-2013).

A public poster session will take place November 12 in the afternoon from 14:45 to 17:00.

## Selected publications

Machine Learning for Multimodal Interaction V  
*A.Popescu-Belis, R. Stiefelhagen*  
Proceedings of MLMI 2008, Utrecht, 8-10 September 2008, LNCS 5237, Springer-Verlag, Berlin/Heidelberg, 364 p.

Towards Audio-Visual On-line Diarization of Participants In Group Meetings.

*H. Hung, G. Friedland*

Accepted for European Conference on Computer Vision (ECCV) 2008, Workshop on Multi-Camera and Multi-Sensor Fusion, Marseille, France, October 2008 (to appear).

*Silence models in weighted finite-state transducers.*

*P. Garner*

In Proceedings of INTERSPEECH, September 2008. Brisbane, Australia.

*Maximum kurtosis beamforming with the generalized sidelobe canceller.*

*K. Kumatani, J. McDonough, B. Raunch, P.Garner, J. Dines, W.Li*

In Proceedings of INTERSPEECH, September 2008. Brisbane, Australia.

*Live Speaker Identification in Conversations.*

*G. Friedland, O. Vinyals*

Accepted for ACM Multimedia 2008, Vancouver, Canada, October 2008 (to appear).

*Writer-dependent recognition of handwritten whiteboard notes in smart meeting room environments.*

*M.Liwicki, A.Schlapbach, H.Bunke*

Proc. 8th IAPR Int. Workshop on Document Analysis Systems, 151-157, 2008.

*3D face recognition using sparse spherical representations.*

*R. Sala Llonch, E. Kokiopoulou, I. Tosic, P.Frossard*

Accepted to IEEE ICPR 2008.

*Credence estimation and error prediction in biometric identity verification.*

*K. Kryszczuk, A. Drygajlo*

Signal Processing, 88 (2008), 916-925.

*Predicting Two Facets of Social Verticality in Meetings from Five-minute Time Slices and Nonverbal Cues.*

*D.Jayagopi, S.Ba, J.-M.Odobez, D.Gatica-Perez*

Proc. Int. Conf. on Multimodal Interfaces (ICMI), Special Session on Social Signal Processing, Chania, Oct. 2008.

*Modeling Dominance in Group Conversations from Nonverbal Activity Cues.*

*D. Jayagopi, H. Hung, C. Yeo, and D. Gatica-Perez*

IEEE Trans. on Audio, Speech, and Language Processing, Special Issue on Multimodal Processing for Speech-based Interactions, accepted for publication.

Social Signal Processing: State-of-the-art and Future Perspectives of an Emerging Domain.

*A. Vinciarelli, M. Pantic, H. Bourlard, A.Pentland*

To be presented in the «Brave New Topic» session at the ACM International Conference on Multimedia, Vancouver (Canada), 2008

*Multi-Camera Tracking and Atypical Motion Detection with Behavioral Maps.*

*J. Berclaz, F. Fleuret and P. Fua*

Proceedings of the European Conference on Computer Vision (ECCV), 2008, to appear.

A comparative study of color image compression standards using perceptually driven quality metrics

*F. De Simone, D. Ticca, F. Dufaux, M.Ansorge, T. Ebrahimi*

in SPIE Optics and Photonics, Applications of Digital Image Processing XXXI, San Diego CA, August 2008.

Capturing the semantics of user interaction: A review and case study

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

Chapter in Emergent Web Intelligence, Springer (to appear).

The AMIDA Automatic Content Linking Device: Just-in-Time Document Retrieval in Meetings

*A. Popescu-Belis, E. Boertjes, J. Kilgour, P.Poller, S. Castronovo, T. Wilson, A. Jaimes, J. Carletta*

Machine Learning for Multimodal Interaction V (Proceedings of MLMI 2008, Utrecht, 8-10 September 2008), LNCS 5237, Springer-Verlag, Berlin/Heidelberg, p.272-283.

Graphical representation of meetings on mobile devices

*L. Matena, A. Jaimes, A. Popescu-Belis*

Proceedings of MobileHCI' 2008 (10th International Conference on Human-Computer Interaction with Mobile Devices and Services), Amsterdam, p.503-506.

Predicting the Dominant Clique in Meetings through Fusion of Nonverbal Cues.

*D. Jayagopi, H. Hung, C. Yeo, and D. Gatica-Perez*

in Proc. ACM Int. Conf. on Multimedia (MM), Vancouver, Oct. 2008.

Overview of IM2 achievements in user-centric design, system integration and evaluation of meeting assistants and browsers.

*D. Lalanne, A. Popescu-Belis*

IM2 technical report, September 2008.

Investigating Automatic Dominance Estimation in Groups from Visual Attention and Speaking Activity.

*H. Hung, D. Jayagopi, S. Ba, J.-M. Odobez, D. Gatica-Perez*

Proc. Int. Conf. on Multimodal Interfaces (ICMI), Chania, Oct. 2008