

# IM2 Newsletter

www.im2.ch

IM2, c/o IDIAP Research Institute, Centre du Parc,  
Rue Marconi 19, P.O. Box 592, 1920 Martigny  
info@im2.ch - www.im2.ch

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## Event

### IM2 FINAL EVENT

As the NCCR is reaching its 12 years, we are organizing a Final Event on **17-18 October 2013** at the **Rolex Learning Center, EPFL, Lausanne.**

The program with Keynote speakers and sessions will be published on the IM2 website very soon.

Please do mark your calendar.

Valais / Wallis 2015 – The Idiap Research Institute selected to lead one out of 13 “star-projects”



The project “Valais\*Wallis Digital” proposed by the Idiap Research Institute seduces the jury of the Bicentenary of Valais’s entry into the Swiss confederation ([www.valais2015.ch](http://www.valais2015.ch)) and is amongst the 13 dossiers selected out of 204 by the Government of Valais. Idiap’s “start-project, further valorizing and perpetuating IM2 research results, will be partly financed by the NCCR’s funds.

On March 27, during a press conference organized specially for the occasion, the President of the Canton of Valais, Mrs E. Waeber-Kalbermatten, proclaimed the project “Valais\*Wallis Digital” of the Idiap Research Institute amongst the happy laureates of the call launched by the Valaisan Government in September 2012. In partnership with Migros Valais, the Academy of Contemporary Arts (EPAC), the Multimedia Library Valais as well as the State Archives of Valais, Idiap’s ambitious project proposes to commemorate as well as celebrate the 200th anniversary of Valais’ entry into the Swiss Confederation by digitalizing the collective memory of the “old country” and its population

by means of an Internet platform. A card game to be played en famille and distributed on a large scale will serve as vector and initiating element to the individual and collective (families, communes, schools, societies...) deposit of archive documents. The realization of the project will be encouraged by a financial support from the Canton.

Further funds will be drawn from IM2 as the project “Valais\*Wallis Digital” presents an ideal opportunity to valorize, disseminate and perpetuate research results developed within the NCCR.

On April 26, the project kick-off meeting took place at the Idiap Research Institute in the presence of all the major partners and stakeholders. There, the project organization structure, divided into 10 work packages, was unveiled and the participants could begin their collaboration during the ensuing aperitif.

Idiap is happy to take an active part in the commemoration of Valais’ entry into the Swiss Confederation through “Valais\*Wallis Digital”, a project wishing to valorize history and traditions as well as to go beyond the celebrations of the year 2015 by making a lasting impact on the future of the Canton.

Martina Guetl

[Martina.Guetl@idiap.ch](mailto:Martina.Guetl@idiap.ch)

Cover Story

## IM2 Final Event (October 17-18, 2013): Please book the date!

To celebrate 12 years of research in Interactive Multimodal Information Technology, we are organizing a Final Event open to a broad scientific community. Idiap Research Institute is happy to announce the program for this event, which will take place at EPFL on October 17-18, 2013.

Amongst the highlights of these two days are the talks of Dr. Pedro Moreno & Prof. Maja Pantic.

Dr. Pedro J. Moreno leads the speech global engineering group at the Android division of Google, where his team is in charge of deploying speech recognition services in as many languages as possible.

Prof Maja Pantic, Professor of Affective and Behavioral Computing at the Imperial College London and the University of Twente, will give a presentation of her research.

In addition, we plan to have an Interactive Session where the most recent developments of IM2 research will be presented. Several legacy sessions will allow start-ups originated from IM2 research and Alumnis to describe their success stories. The 2 days of presentations will conclude with a round table discussion.

THURSDAY OCTOBER 17 <sup>th</sup> , 2013		FRIDAY OCTOBER 18 <sup>th</sup> , 2013	
09.00-09.15	Opening by NCCR director: Prof Hervé Bourlard	09.00-09.15	Opening
09.15-10.00	Dr. Pedro MORENO (Keynote speaker) From "Research At Google" Lab	09.15-10.00	Prof. Maja PANTIC (Keynote speaker) Professor at Imperial College London
10.00-10.30	Coffee break	10.00-10.30	Coffee break
10.30-12.30	IM2 internal scientific talks	10.30-11.30	Legacy 2: IM2 startup jamboree
		11.30-12.30	Legacy 3: EU projects and other projects follow-ups
12.30-14.00	Lunch	12.30-14.00	Lunch
14.00-16.00	Interactive session & Coffee	14.00-15.00	Keynote speaker TBA
		15.00-15.30	Coffee break
		15.30-16.30	Round Table Discussion
16.00-17.00	Legacy 1: IM2 alumni session	16.30-16.45	Conclusion by NCCR director
19.00	Dinner		End

Léonore Miauton  
[leonore.miauton@idiap.ch](mailto:leonore.miauton@idiap.ch)

## IM2 start-up nViso wins 2013 IBM Beacon Award for Smarter Computing and established a partnership with Sands Research



We are delighted to announce that the IM2 spin-off nViso has won the 2013 IBM Beacon Award for Smarter Computing for best Cloud Application Provider last March. This honor is awarded each year in recognition of a select number of IBM Business Partners who have delivered not only innovative solutions but have set the standards for business excellence, ingenuity, and

creation of an exceptional client experience.

Two weeks later, nViso – a leading provider of emotion recognition software that interprets human facial micro-expressions and eye-movements captured on video – made public its partnership with Sands Research, a leader in EEG (brainwave) and eye-tracking market research analysis. The two companies will combine their advanced software on a single platform / service offering.

François Foglia  
[Francois.Foglia@idiap.ch](mailto:Francois.Foglia@idiap.ch)

**PHD THESIS David Imseng**

MULTILINGUAL SPEECH RECOGNITION - A POSTERIOR BASED APPROACH



Modern automatic speech recognition systems are based on parametric statistical models that exploit 1) acoustic-phonetic models, which need to be trained on large amount of acoustic data, 2) a language model, which needs to be trained on large amount of text data and, finally, 3) a lexicon with phonetic transcription which requires linguistic expertise. Developing multilingual automatic speech recognition systems, or systems that are robust to accents and dialects, is therefore a very challenging task. In this thesis, we focused on investigating acoustic-phonetic modeling and lexical diversity across languages and databases. We built upon a recently proposed acoustic modeling approach, referred to as KL-HMM, where posterior probabilities, estimated by a multilayer perceptron, are directly used as acoustic features. The HMM states are then

parametrized by trained reference posterior probabilities that are estimated by minimizing the Kullback-Leibler divergence between posterior features and reference posteriors.

The proposed KL-HMM model was extensively developed and adapted to tackle several challenging problems related to multilingual automatic speech recognition, including lexical diversity, stochastic phone space transformations, accented speech recognition and using multilingual data resources to boost monolingual systems. The efficiency of the proposed approach was demonstrated through theoretical and experimental comparisons with similar approaches. These comparisons revealed that the KL-HMM framework is a suitable alternative to conventional acoustic modeling techniques and seems to be preferable in low amount of data as well as phoneme set mismatch scenarios

*David Imseng**[David.Imseng@idiap.ch](mailto:David.Imseng@idiap.ch)***PhD Thesis Ivan Ivanov (MMSPG, EPFL)**

ADVANCED SOCIAL MEDIA ANALYSIS



Ivan Ivanov successfully defended his PhD thesis entitled "Advanced Social Media Analysis" at EPFL. This research, supervised by Prof. Touradj Ebrahimi, was part of one of the activities carried out by Multimedia Signal Processing Group (MMSPG) under IM2.IP1.

Ivan's thesis deals with enhancing users' experience when consuming social media. Social media has three key components: users, content, and metadata. Therefore, the overall objective of the thesis is to explore existing and identify new techniques to efficiently enrich each of these three components.

For example, having adequate metadata in a social media platform, in particular appropriate tags, can improve search results when performed using keywords. Based on such observations, Ivan proposed to use similarity between image content (objects in images) and context (associated tags) to automatically annotate non-tagged images – he refers to this challenge as metadata enrichment.

A significant subset of shared photos in social media is travel related and is associated with geotags. Ivan adapted a previous approach to increase accessibility of non-geotagged photos for the purpose of exploring them when planning vacation or simple classification after return from vacation. However, wrong or spam tags can damage the reliability of the social media. Therefore, he investigated and proposes new techniques to model users' reliability in tagging – he refers to this challenge as user enrichment.

Finally, social media consumption is more effective if it engages users through one of the most natural, pervasive, and gratifying activities of human beings: gaming. Therefore, he investigated and proposed a solution on how social gaming can be used to address the challenge of photo album summarization – this challenge is referred in the thesis as content enrichment.

*Ivan Ivanov**[ivan.ivanov@epfl.ch](mailto:ivan.ivanov@epfl.ch)*

## News

### AIM2 Website is online

Since the beginning of April, the AIM2's (Association Interactive Multimodal Information Management) website is online. Under [www.aim2.ch](http://www.aim2.ch) you can stay informed about the association's activities and news. The AIM2 has been created in March 2012 in order to ensure the continuum of the technological and economic achievements of IM" and to sustainably secure an implementation of the NCCR's mission after 2013.

*Martina Guetl*  
[Martina.Guetl@idiap.ch](mailto:Martina.Guetl@idiap.ch)

### Book announcement Interactive Multimodal Information Management, edited by Hervé Boulevard and Andrei Popescu-Belis, EPFL Press, to appear

A synthesis book on IM2 will be published by EPFL Press in autumn 2013, before the IM2 final workshop. The book brings together perspectives on the main scientific achievements of IM2, but also on its structural impact. The 20 scientific chapters, contributed by 34 researchers, emphasize the progress that was made thanks to the long-term funding provided by the SNSF, showing how research on each topic unfolded over several interrelated PhD theses. The book is structured around the main thrust of IM2, the multimodal analysis of human conversations, in view of their indexing and interactive retrieval. Following an introduction to the vision of IM2, the book has three scientific parts: (I) human-computer interaction and human factors; (II) visual and multimodal analysis of human appearance and

behavior; and (III) speech, language, and document processing. A fourth part offers an external assessment of IM2, an overview of technology transfer, and perspectives on the future of the IM2 research fields.

*Andrei Popescu Belis*  
[Andrei.Popescu-Belis@idiap.ch](mailto:Andrei.Popescu-Belis@idiap.ch)

### Gelareh Mohammadi receives Google Anita Borg Memorial Scholarship 2013

The Idiap research institute is pleased and proud to announce, for the third time, one of its PhD students (Gelareh Mohammadi) is selected amongst the recipients of the Google Anita Borg Memorial Scholarship. The scholarship program wishes to support women studying computing at undergraduate and postgraduate level. Gelareh Mohammadi is working on «Personality Perception from Nonverbal Vocal behavior» for her PhD thesis. Her research has been supported by CCPP, SSPNet and IM2.

*Léonore Miauton*  
[Leonore.Miauton@idiap.ch](mailto:Leonore.Miauton@idiap.ch)

### Joan-Isaac Biel Tres defended PhD thesis at EPFL

Joan-Isaac Biel Tres (Idiap) successfully defended his PhD thesis at his private exam at EPFL on May 16th, 2013. Joan's dissertation is entitled «Mining Conversational Social Video» and was supported by IM2.IP1. His jury included Prof. Matthias Mehl (University of Arizona, USA), Dr. Bernardo Huberman (HP Labs, USA), Prof. Pascal Frossard (EPFL), Prof. Sabine Susstrunk (EPFL) and Dr. Daniel Gatica-Perez (Idiap, doctoral advisor). His public defense is planned for June 2013. Congratulations to Joan!

*Daniel Gatica-Perez*  
[Daniel.Gatica-Perez@idiap.ch](mailto:Daniel.Gatica-Perez@idiap.ch)

## Selected publications

Euclidean Distance Matrix Completion for Ad-hoc Microphone Array Calibration

*Taghizadeh et al.*

accepted for presentation at the 18th International Conference on Digital Signal Processing (DSP)

MOOCs Are More Social than You Believe

*J. Blom, H. Verma, N. Li, A. Skevi, P. Dillenbourg*

Special issue of eLearning Papers on MOOCs and Beyond

On the Influence of Emotional Feedback on Emotion Recognition and Gaze Behavior

*F. Ringeval, A. Sonderegger, B. Noris, A. Billard, J. Sauer and D. Lalanne*

submitted to Affective Computing and Intelligent Interaction - ACII, Geneva, September 2-5 2013

Metric Suffix Array For Large-Scale Similarity Search

*Mohamed, H., & Marchand-Maillet Stéphane*

In ACM WSDM 2013 Workshop on Large Scale and Distributed Systems for Information Retrieval, Rome, IT

The YouTube? Lens: Crowdsourced Personality Impressions and Audiovisual Analysis of Vlogs

*J.-I. Biel and D. Gatica-Perez*

IEEE Trans. on Multimedia, Vol. 15, No. 1, pp. 41-55, Jan. 2013

Learning Representative Nodes in Social Networks

*Sun, K., Morrison, D., Bruno, E., & Marchand-Maillet, S.*

In 17th Pacific-Asia Conference on Knowledge Discovery and Data Mining, Gold Coast, AU (2013)