

IM2 Newsletter

Contents

COVER STORY

- New collaborative project between Idiap, Nokia Research Center and EPFL 1

FOCUS

- Joint SNF project between IM2 and Affective Sciences NCCR 2
- IM2 Summer Institute 2009 3
- Completed Thesis 4

INSIDE IM2

- News
- Selected publications

News

IM2 Summer Institute

August 31st, September 1-2nd, 2009

Chavannes-de-Bogis, GE

<http://www.im2.ch/summer-institute-2009>

ETHZ Summer School

August 17th-21st, 2009

Zurich

<http://www.vision.ee.ethz.ch/summerschool2009>

Cover Story

New collaborative project between Idiap, Nokia Research Center and EPFL

LARGE-SCALE HUMAN CONTEXT DISCOVERY FROM MOBILE PHONES

Idiap has started a new research project in collaboration with Nokia Research Center Lausanne (NRC) that has connections with the scope of IM2.

Daniel Gatica-Perez is the Principal Investigator of LS-CONTEXT (Large-Scale Human Context Discovery from Mobile Phones), which will investigate probabilistic methods to discover personal and social behavioral patterns from cell phone data. The project addresses three goals.

The first one is the creation of research resources for large-scale behavioral modeling from mobile sensor data. Cell phones are rapidly becoming the ultimate sensor. Equipped with accelerometers, GPS, Bluetooth, in addition to communication and internet access capabilities, cell phones can ubiquitously trace individual and social activities for entire populations, and therefore are opening novel possibilities for research in several sciences.

In a collaborative effort between NRC (Niko Kiukkonen), EPFL (Jeffrey Newman from the Transport and Mobility Lab), and Idiap, a large-scale data collection campaign is under development, with the goal of recording real-life sensor data for a population of around 100 volunteers. NRC is instrumental in sharing their experience ranging from mobile sensing to data management and privacy protection mechanisms.

The second objective of the project is the development of algorithms to



*Nokia N95 device
courtesy of Nokia*

robustly represent human behavior at the personal and group level, based on the integration of heterogeneous observation sources - location, motion, proximity, and communication.

These behavioral descriptors would provide short-term snapshots of the physical and social pace of people's life. Finally, the third goal is the development of machine learning methods to automatically discover

To be continued on page 2

New collaborative project between Idiap, Nokia Research Center and EPFL (continued)

long-term personal routines (regularities in people's lives) and to discover and characterize groups from communication patterns, mutual proximity, and similar routines.

Overall, the project aims at designing algorithms capable of answering questions like: What are the common daily routines of the population? Was today an unusual day for a certain person?

How are the existing sub-communities in the population related to each other? The research could also allow to build individually and socially meaningful mobile applications, and to pose new questions in social sciences.

*Daniel Gatica-Perez
Idiap Research Institute*

**Joint SNF project between IM2 and Affective Sciences NCCR
LED BY UNIGE CVML - MULTIMODAL INTERACTION GROUP**

This project, "Emotion-driven personalized content-based multimedia management", addresses the following research questions: can affective reactions of the spectator of a movie be accurately determined, and can they be accurately predicted from the movie content? To answer this, the following experiment was performed.

Participants viewed a number of clips, while their physiological signals were recorded (blood pressure, breathing, muscular activity, skin resistance and temperature). Participants were then asked to self-assess their emotional arousal and valence for each clip. In addition, content-based audio- and video- features were extracted from the movie scenes in order to characterize each scene.

Degrees of arousal and valence were estimated by combining features from physiological signals, as well as by combining content-based features. We showed that a significant correlation exists between self-assessments and affective grades obtained automatically from either physiological responses or content-based features. The variations of participants' self assessments and gender groups self assessments for both valence and arousal were significant. These results demonstrate the ability of using content-based features and physiological responses to determine and further predict the expected affective response to the emotional video. It was also possible to detect which part of the clips elicited the most interest.

Interface for the video affective annotation experiment

Several extensions of this work are being pursued. Automated affective assessment can be used for implicit tagging; further experiments are underway in the context of the Petamedia NOE (of which IM2 is a partner), where other modalities are added (e.g., face tracking). Affective profiling of social groups is also being pursued, with applications in movie indexing and retrieval.

*Thierry Pun
University of Geneva*

Note: We are currently running an anonymous experiment to assess emotions from videos and we would very much appreciate it if you reader would participate. In this experiment, you will watch clips extracted from movies of different genres and you will be asked to give feedback about your emotion. You can annotate as many clips as you like, each lasting about 1 to 2 minutes (please see <http://cvml.unige.ch/videoAnnotation/>).

IM2 Summer Institute '09

AUGUST 31ST TO SEPTEMBER 2ND, CHAVANNES-DE-BOGIS

This year, the IM2 Summer Institute will be held in Chavannes-de-Bogis (Best Western Hotel) from the 31st of August until the 2nd of September.

The first day will be dedicated entirely to the second phase (2006-2009) of the project. After the welcome and overview of the second phase, the key achievements of ongoing individual projects will be presented by the IP Heads. The day will finish with presentations by some PhD and PostDoc students who will talk in more detail about their scientific results.

The second and third day will focus on the third, and last, phase of IM2 (2010-2013). On Tuesday, after visiting CERN, the global objectives of the next period will



be outlined and the two new partners, Prof. J. Sauer and Prof. P. Dillenbourg, will have the opportunity to introduce themselves.

Finally, Wednesday will start with a poster session which will foster discussions and exchanges of ideas. Then there will be three parallel brainstorming sessions: two sessions are dedicated to outlining potential applications for the third phase and one session is dedicated to developing a strategy for keeping the IM2 community alive after the end of the project.

More information is available at:
<http://www.im2.ch/summer-institute-2009>

François Foglia
Idiap Research Institute

Monday 31.08.09	Tuesday 01.09.09	Wednesday 02.09.09
10:45-11:30 Travel Arrivals at the Best Western Hôtel	09:00-12:30 Parallel activities: ACTIVITY 1: CERN (max 48p) ACTIVITY 2: United Nations Office at Geneva ACTIVITY 3: Personal work	08:45-11:00 Poster Session 11:00-12:30 (Heads of IP 2, J. Sauer, P. Dillenbourg) Parallel Workshops: 1. Enhancing teamwork with unobstructive devices 2. Document-based retrieval of multimedia content and user evaluations 3. Building and consolidating a long-lasting IM2 community
12:00-13:30 Lunch	13:00-14:30 Lunch	12:30-13:30 Lunch
13:30-14:00 (H. Bourlard & T. Ebrahimi) Welcome + overview of Phase II	14:30-14:45 (H. Bourlard & T. Ebrahimi) Introduction about IM2 Phase III	13:30-14:30 (Heads of IP 2, J. Sauer & P. Dillenbourg) Parallel Workshops (continued)
14:00-16:00 (Phase II IP Heads) Presentation of the IM2 Phase II key achievements	14:45-16:30 (Phase III IP Heads) Presentation of people & objectives of new IPs (30mn each): - IP1: Integrated Multimodal Processing - IP2: Human Centered Design and Evaluation - IP3: Social Signal Processing	14:30-15:00 Conclusions of workshops Speakers: Chairmen Outcomes and conclusions of the Summer Institute Speakers: H. Bourlard / T. Ebrahimi
16:00-16:30 Coffee break	16:30-17:00 Coffee break	15:00 END of Summer Institute Travel: Minibus to Coppet Station & Geneva Airport
16:30-18:30 (IM2 Phase II Phd & PostDoc) Parallel sessions - Scientific presentations (20 mn presentation, 10 mn questions)	17:00-18:30 (J. Sauer & P. Dillenbourg) Presentation of new partners and contribution in IM2 Phase III (45mn each)	16:00-16:20 (IP Heads Phase II and III) Special session IM2 Technical Committee
19:00 Dinner	19:15 Dinner	

Completed Thesis, Philipp Zehnder, ETHZ

EFFICIENT MULTI-CLASS OBJECT DETECTION

Philipp Zehnder has successfully defended his PhD Thesis on "Efficient Multi-Class Object Detection" on Friday 19th of June 2009. The thesis was focused on making visual object class recognition scalable.

The state-of-the-art would require to learn and then separately run as many detectors as there are object classes. This is not sustainable when the number of classes grows. Estimates for the total number of visual

classes are around 30,000. Rather, one would like to achieve detection times that grow sublinearly with this number. Philipp Zehnder devised such scheme, which boosts performance by letting object classes share features. Also the training of the multi-class detection scheme was designed to be very efficient.

Luc Van Gool
vangool@vision.ee.ethz.ch

Photo: Philipp Zehnder, ETHZ



News

Best Vision Paper Award

ETHZ Computer Vision

ETHZ Computer Vision Lab researchers won the Best Vision Paper Award at the International Conference on Robotics and Automation (ICRA), held in Kobe, May 2009.

The rewarded work finds and tracks pedestrians in realistic shopping street environments, from a mobile platform. The rewarded paper is A. Ess, B. Leibe, K. Schindler, and L. van Gool. Moving Obstacle Detection in Highly Dynamic Scenes

Luc Van Gool
vangool@vision.ee.ethz.ch

Interview of a IM2 partner

Euresearch Newsletter, July 2009

Sébastien Marcel, a researcher from the Idiap Research Institute in Martigny has been interviewed by Euresearch about his participation as a coordinator in an European project called MOBIO (Mobile Biometry).

Euresearch is responsible for providing specific information and counselling to all interested researchers from the private sector and public institutions about participation in EU research framework programmes and cost activities.

For more information about the project, visit:
<http://www.mobioproject.org/>

The newsletter (french/german) is available at:
<http://www.euresearch.ch/index.php?id=662>

Valérie Devanthery
valerie.devanthery@idiap.ch

Klewel: Top 5 for the Innovation Award

AIPC '09 - A Coruña - Spain

On the 6th of July, in the context of the international annual congress AIPC 2009 (International Association of Congress Centres) at A Coruña — Spain, the Montreux Music Convention Center (2M2C) in collaboration with the start-up Klewel was elected finalist of the AIPC Innovation Award competition.

AIPC is committed to encouraging and recognizing excellence in convention centre management, while at the same time providing the tools to achieve such high standards through its research, educational and networking programs. This prestigious competition gathers the most innovative congress centers in the world.

Since more than a year, the 2M2C innovates in terms of video distribution of conference content. Thanks to a close collaboration with Klewel, a Swiss start-up, the 2M2C proposes to its customers innovative services for capturing, indexing and putting online audiovisual content of congresses.

Maël Guillemot
mael.guillemot@klewel.com

ETHZ Vision and Sports summer school

Zurich, August 17-21, 2009

The Computer Vision Lab of ETHZ organises the Vision and Sports summer school during the week 17-21 August. In addition to a broad-range of lectures on state-of-the-art Computer Vision techniques, it offers exciting sport activities, such as Kung-Fu, Ultimate Frisbee, and Volleyball. What is most fun: the sports sessions are given by the same internationally renowned experts who deliver the lectures! This will offer plenty of opportunity for personal contact between students and teachers. How would you like to beat your teacher in a tennis match? Or play in the same Volleyball team?

For more information, visit <http://www.vision.ee.ethz.ch/summerschool2009>

Luc Van Gool
vangool@vision.ee.ethz.ch

IJCAI-09: Workshop held by a IM2 partner

Pasadena, USA, July 13th, 2009

At the 21st International Joint Conference on Artificial Intelligence (IJCAI-09, Pasadena, July 13th), profs. Luc Van Gool and Vittorio Ferrari of the ETHZ Computer Vision Lab organised a workshop on the theme CROSS-MEDIA INFORMATION ACCESS AND MINING (CIAM 2009), together with prof. Tuytelaars en Moens of Kath. Un. Leuven. Apart from several high-quality, regular talks, the workshop had Kobus Barnard, Mark Maybury, Raymond Mooney, and Till Quack as invited speakers.

The purpose of this workshop was to bring together researchers from computer vision, sound processing, human language technology, computational linguistics, artificial intelligence, machine learning, reasoning, information retrieval, cognitive science and application communities. The practical aim was to foster interdisciplinary methods to effectively understand and archive the information contained in a swelling flux of multimedia data. Content recognition in the visual, textual or audio medium can be improved by exploiting cross-modal co-occurrences. Content recognized in one medium can serve as weak annotation

for content to be learned in another medium. Content recognition also entails content linking across media, such as cross-document coreferencing (or alignment). Moreover, the initially identified alignments might bootstrap additional cross-modal «translations».

For more information, visit <http://ijcai-09.org>

Luc Van Gool
vangool@vision.ee.ethz.ch

KeyLemon invited to the Venture leaders '09 event

Boston, June 9th - 19th

KeyLemon went to Boston to participate in the ventureleader program. Like every previous edition, the 20 entrepreneurs selected this year had a full program in Boston from June 9th to 19th.

They visited local high tech companies, received academic training from Babson College-Professors, interacted with experts and most importantly network with local entrepreneurs, investors and other members of the high-tech community. Ernst & Young joined the program as a partner this year and put together an afternoon session as well.

Valérie Devanthery
valerie.devanthery@idiap.ch

Selected publications

Multiview clustering: a late fusion approach using latent models.

E. Bruno, S. Marchand-Maillet

In Proceedings of the 32nd ACM Special Interest Group on Information Retrieval Conference, SIGIR 09, Boston, USA, 2009.

Prosodic and other Long-Term Features for Speaker Diarization.

G. Friedland, O. Vinyals, Y. Huang, C. Müller

IEEE Transactions on Audio, Speech, and Language Processing, Vol 17, No 5, pp 985--993, July 2009.

A Global Optimization Framework for Meeting Summarization.

D. Gillick, K. Riedhammer, B. Favre, D. Hakkani-Tür

IEEE International Conference in Acoustics, Speech and Signal Processing (ICASSP) 2009, Taipei (Taiwan)

Improving biometric verification with class-independent quality information.

K. Kryszczuk, A. Drygajlo

IET Signal Processing, Special Issue on Biometric Recognition, vol. 3, issue 4, 2009, pp. 310-321.