

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 SUMMER INSTITUTE
Centre du Parc, Martigny
September 3-4, 2012

<http://www.im2.ch/summer-institute-2012>

Cover Story

International Create Challenge, ICC'2012 FROM CODES TO COMPANY

The International Create Challenge (ICC'2012, www.createchallenge.org), which will take place in Martigny, September 1-21, is an initiative supported by IM2, via its association AIM2, and Idiap. The main goal of this event is to foster the creation of start-ups within the framework of Human & Media Computing.

The ICC'2012 structure is a free of charge 3-week immersive technology transfer accelerator program giving entrepreneurs the unique opportunity to develop their original idea towards a «Minimum Viable Product» (e.g., demonstrator, product prototype) in collaboration with groups of entrepreneurs and researchers.

ICC'2012 combines the availability of state-of-the-art technologies, cutting edge research, mentor-led coaching, and micro-seed investment. The winning team(s) will share global award amounting to more than 200'000 CHF.

The 2-step selection procedure was very selective. At the first round, May 30, 55 people were selected based on their motivation to participate and their CVs. Then, the selected candidates had 1.5 months to setup a team of 2 to 4 people and propose ideas. Finally, 15 projects were submitted (July 15)



out of which 12 were accepted to participate by the ICC'2012 Jury composed by 10 high level people coming from the financial, innovation and scientific worlds. The origin of the teams is mostly Swiss (ETHZ, EPFL, Idiap, etc) and European (UK; Romania, Greece, etc).

With the objective to build an important network around the IM2/Idiap technologies, this year, the IM2 summer school is organized in the framework of the ICC'2012. During 2 days (September 3-4), the ICC'2012 selected project participants and the IM2 scientists will exchange experiences, knowledge, ideas and possibly codes with the hope to setup new successful ventures.



François Foglia
Francois.Foglia@idiap.ch

BOB is born

After a bit less than 2 years of intense development, we are proud to announce the immediate availability of Bob 1.0 as an open-source project.

Bob has distant roots from Torch3vision (<http://torch3vision.idiap.ch/>), a variant of Torch (<http://www.torch.ch/torch3/>), which was/is a framework for machine learning, initially developed at the Idiap Research Institute (<http://www.idiap.ch/>) in Switzerland. It diverged from Torch in its infancy to become a completely independent project focused primarily on tools for biometrics, forensics, machine learning and signal processing.

You can go to our homepage at <http://idiap.github.com/bob/> and fetch source code or pre-compiled binaries for various platforms.



About Bob

Bob is a free signal-processing and machine learning toolbox originally developed by the Biometrics group at Idiap Research Institute, Switzerland. The toolbox is written in a mix of Python and C++ and is designed to be both efficient and reduce development time.

Sébastien Marcel
Sebastien.Marcel@idiap.ch

Constantin Cosmin Atanasoaei, IDIAP

MULTIVARIATE BOOSTING WITH LOOK-UP TABLES FOR FACE PROCESSING



This thesis proposes a novel unified boosting framework. We apply this framework to the several face processing tasks, face detection, facial feature localisation, and pose classification, and use the same boosting algorithm and the same pool of features (local binary features). This is in contrast with the standard approaches that make use of a variety of features and models, for example AdaBoost, cascades of boosted classifiers and Active Appearance Models.

The unified boosting framework covers multivariate classification and regression problems and it is achieved by interpreting boosting as optimization in the functional space of the weak learners. Thus a wide range of smooth loss functions can be optimized with the same algorithm. There are two general optimization strategies we propose that extend recent works on TaylorBoost and Variational AdaBoost. The first proposition is an empirical expectation formulation that minimizes the average loss and the second is a variational formulation that includes an additional penalty for large variations between predictions.

These two boosting formulations are used to train real-time models using local binary features. This is achieved

using look-up-tables as weak learners and multi-block Local Binary Patterns as features. The resulting boosting algorithms are simple, efficient and easily scalable with the available resources. Furthermore, we introduce a novel coarse-to-fine feature selection method to handle high resolution models and a bootstrapping algorithm to sample representative training data from very large pools of data.

The proposed approach is evaluated for several face processing tasks. These tasks include frontal face detection (binary classification), facial feature localization (multivariate regression) and pose estimation (multivariate classification). Several studies are performed to assess different optimization algorithms, bootstrapping parametrizations and feature sharing methods (for the multivariate case). The results show good performance for all of these tasks.

In addition to this, two other contributions are presented. First, we propose a context-based model for removing the false alarms generated by a given generic face detector. Second, we propose a new face detector that predicts the Jaccard distance between the current location and the ground truth. This allows us to formulate the face detection problem as a regression task.

Sébastien Marcel
Sebastien.Marcel@idiap.ch

ERC Advanced Grant

LUC VAN GOOL AWARDED

Prof. Luc Van Gool of the Computer Vision Laboratory of D-ITET, the EE Dept. of ETHZ, has been awarded an ERC Advanced Grant. The ERC project was coined «Variation & the City», abbreviated to VarCity (thus referring to varsity). The project has officially started on May 1st 2012 and will last for five years. ERC Grants are awarded to individual researchers, in contrast to regular European projects. VarCity aims at producing compact and realistic 4D city models. It will work towards efficiently producing semantically structured models, starting from photographs (so-called inverse procedural



modeling). But an important part is also the capturing of dynamics aspects of cities, like the traffic flows. This work will be helped substantially by leveraging work carried out under the IM2 NCCR. The figure shows procedural mockups for Rotterdam (left) and Venice (right), produced with the CityEngine software of ETH-CVL's spin-off Procedural (now part of ESRI). The intention is to arrive at such results with fewer manual interaction, yet to remain closer to the appearance of the actual buildings.

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

SSMS 2012: Summer School on Social Media Modeling and Search

SEPTEMBER 10-14, 2012, SANTORINI, GREECE

The 2012 Summer School on Social Media Modeling and Search will be held on September 10-14, 2012 in Fira, Santorini, Greece. The 6th edition of the summer school is organized by the EU projects SocialSensor and Cubrik, and supported by EuroMM - the European chapter of the ACM Special Interest Group on Multimedia (SIGMM).

The School is aimed at PhD students, young researchers, and practitioners interested in social media modeling and analysis, online social interaction analysis, and prediction, search and visualization applications. The event features five days of lectures by researchers in academia and

industry covering theoretical and practical aspects of this multidisciplinary domain, a Media Industry day, and a student poster session. The list of lecturers include Daniel Gatica-Perez (Idiap), Rong Yan (Facebook), Santo Fortunato (Aalto University), Alex Jaimes (Yahoo! Research), Sebastiano Vigna (University of Milan), Hakim Hacid (Alcatel-Lucent), and Herve Jegou (INRIA). More information at <http://ssms2012.socialsensor.eu/>

Daniel Gatica-Perez
Gatica@idiap.ch

Idiap well represented in Bilan's Top 300 most influential personalities

PROF. HERVE BOURLARD AND DR SEBASTIEN MARCEL NOMINATED



In its issue of 20 June 2012, the Swiss economic journal Bilan released its annual ranking for the top 300 «most influential personalities» in Switzerland. Idiap was pleased to count two of its scientists among that list (2 out of 12 for the State of Valais): its Director Prof Hervé Bourlard and the Senior Researcher Dr Sébastien Marcel.

Prof. Hervé Bourlard is recognized for his leadership in turning Idiap into one of the leading research institutes specialized in man-machine interaction, now also a nest of promising start-ups such as Koemei and Klewel.

The Senior Researcher Dr. Sébastien Marcel and his team are recognized for their established leadership in biometrics, with the development of numerous national and international initiatives, including e.g. the recent EU project BEAT (Biometrics Evaluation and Testing) with a budget of 5 million Euros.

Christophe Ecoeur
christophe.ecoeur@idiap.ch

News

Slew of IM2-related PhDs at ETH-CVL

Both PhD students that worked most recently on IM2 for ETH's Computer Vision Lab, have defended their PhD Theses: Stefano Pellegrini on the 3. of April 2012 on «Modeling and Tracking Social Walkers», and Angela Yao on the 26. April 2012, on Vision-Based Human Motion Analysis. Also Gabriele Fanelli, who has been in close contact with the project over the last years, defended, on Automatic Head and Face Analysis for Human-Computer Interaction, on the 3. of April 2012.

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

Hevala 2008-2011 Best Paper Award for ETH-CVL

The Computer Vision Lab of ETH Zurich was rewarded with the Hevala Award of the ISPRS International Journal of Photogrammetry and Remote Sensing. This prize is awarded for the most outstanding paper published in the journal over the last 4 years. The paper in question is Konrad Schindler, Andreas Ess, Bastian Leibe, and Luc Van Gool, «Automatic detection and tracking of pedestrians from a moving stereo rig.» and awarded the Award for the period 2008-2011. The U.V. Helava Award, one of the most prestigious ISPRS awards, was established in 1998 and first presented in 2000. The recipients of the Award may receive it only once. The award consists of a monetary grant of 10,000 SFr., certificates, and a silver plaque. It is sponsored by Elsevier B.V. and Hexagon Geosystems. A five-member jury, comprising experts of high scientific standing, whose expertise covers

the main topics included in the scope of the Journal, evaluated 261 papers for the period 2008-2011.

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

BEST STUDENT PAPER FOR KENNETH FUNES

Best student paper for Kenneth Funes at the CVPR workshop on Gesture Recognition, 2012. K. Funes received his prize for the paper «Gaze estimation from multimodal Kinect data» co-authored with Jean-Marc Odobez, describing his research for head-free gaze estimation without constraints and that opens the door for new applications. The well attended workshop was co-organized by Isabelle Guyon, Vassilis Athitsos and Alex Kipman, the team director at Microsoft of the Kinect development.

Jean-Marc Odobez
Odobez@idiap.ch

Selected publications

Evaluation of Visual privacy Filters Impact on Video Surveillance Intelligibility

P. Korshunov, C. Araimo, F. De Simone, C. Velardo, J.-L. Dugelay, and T. Ebrahimi

accepted in the fourth international workshop on quality of multimedia experience QoMEX 2012, Yarra Valley, Australia, July 2012

Quality Assessment of Asymmetric Stereo Pair Formed From Decoded and Synthesized Views

P. Hanhart, F. De Simone, T. Ebrahimi,

accepted in the fourth international workshop on quality of multimedia experience QoMEX 2012, Yarra Valley, Australia, July 2012

The Good, The Bad, and the Angry: Analyzing Crowdsourced

Impressions of Vloggers

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

In Proc. AAAI Int. Conf. on Weblogs and Social Media, Dublin, June 2012. Evaluation of meeting support technology

A TDOA Gaussian mixture model for improving acoustic source tracking

Y. Oualil, F. Faubel, M. Magimai-Doss and D. Klakow

in Proc. of EUSIPCO, Aug. 2012

Microphone array beampattern characterization for hands-free speech applications

Mohammad J. Taghizadeh, Philip N. Garner, and Hervé Bourlard

In Proceedings of the Seventh IEEE Sensor Array and Multichannel Signal Processing Workshop, pages 473-476, Hoboken, NJ, USA, June 2012

Predicting the Conflict Level in Television Political Debates: an Approach Based on Crowdsourcing, Nonverbal Communication and Gaussian Processes.

S. Kim, M. Filippone, F. Valente and A. Vinciarelli

In Proceedings of ACM International Conference on Multimedia, Nara, 2012

From Speech to Personality: Mapping Voice Quality and Intonation into Personality Differences.

G. Mohammadi, A. Origlia, M. Filippone and A. Vinciarelli.

In Proceedings of ACM International Conference on Multimedia, Nara, 2012

Enhancing MapReduce using MPI and an optimized data exchange policy

Mohamed, H., & Marchand-Maillet, Stéphane

In Fifth International Workshop on Parallel Programming Models and Systems Software for High-End Computing (P2S2), Pittsburgh.