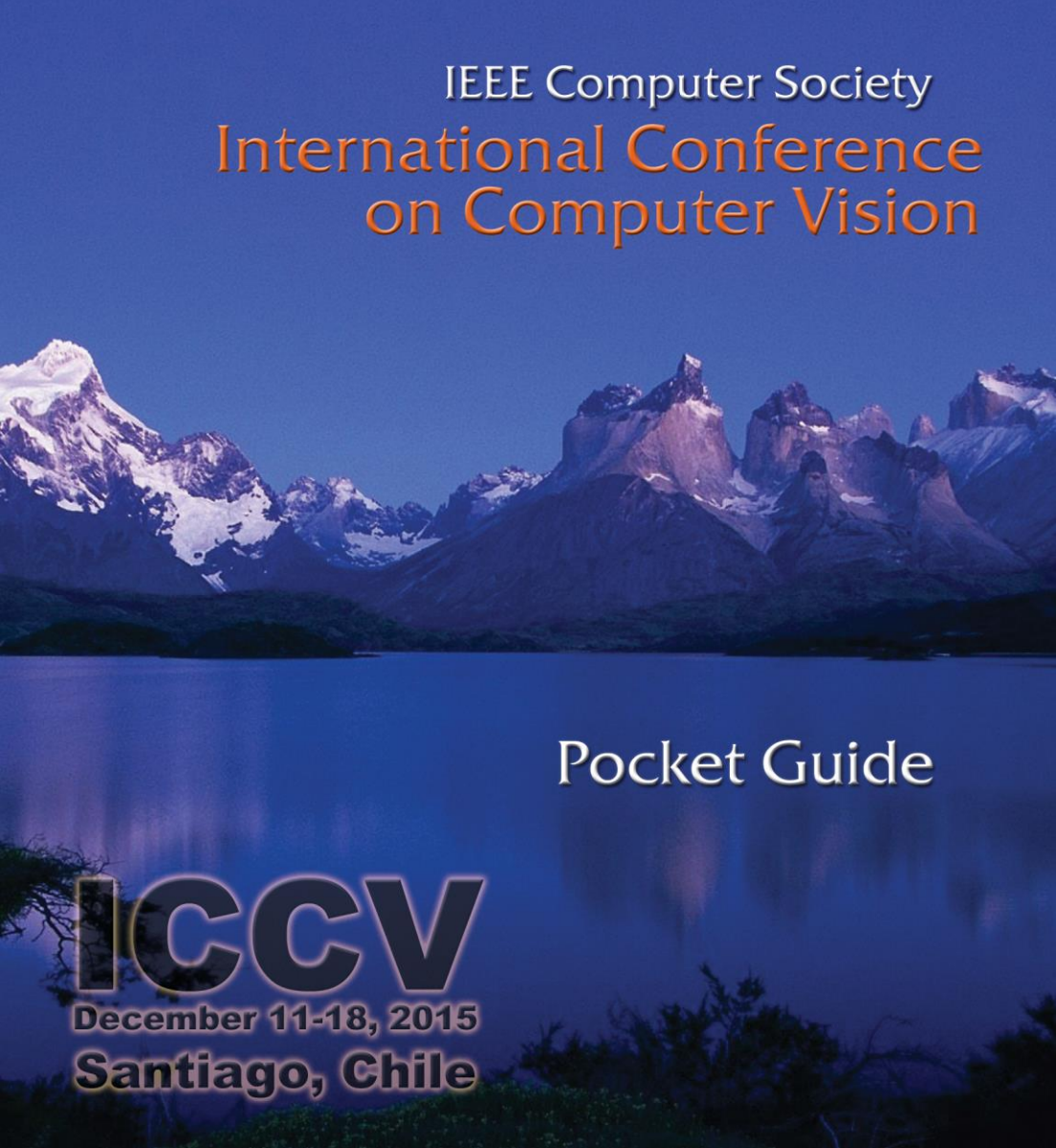
IEEE Computer Society
International Conference on Computer Vision
Pocket Guide
ICCV
December 11-18, 2015
Santiago, Chile

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Message from the General and Program Chairs

Welcome to Santiago de Chile and to the 15th IEEE International Conference on Computer Vision (ICCV). The conference's main program includes 525 peer-reviewed papers (30.3% of 1698 valid submissions), which were allocated a poster presentation as well as a video spotlight that will play during each poster session. All spotlights were edited into videos for each session, which were uploaded to YouTube. Of these papers, 56 (3.3% of valid submissions) were selected for oral presentation. The conference's main program also includes a plenary lecture by Prof. Stephen Boyd accompanied by an invited paper, a doctoral consortium, 13 demos, 10 exhibitors, and various social functions. In addition to the main program, ICCV 2015 has a number of co-located events, including 10 tutorials and 27 workshops. ICCV 2015 also enjoyed a record amount of industrial sponsorship which supported best paper awards, the doctoral consortium, and travel support for early career researchers.

The paper selection process was designed by the Program Chairs (PCs), who recruited 115 computer vision researchers to serve as Area Chairs (ACs). ACs were selected to provide a broad range of expertise, to balance junior and senior members, and to represent a variety of geographical locations. In general, PCs selected ACs who had served no more than 3 times in the 3 major computer vision conferences in the last 5 years, and selected no more than one AC per institution. A few exceptions were made when ACs for specific areas were needed. The PCs also recruited 1233 experienced reviewers from the broader computer vision community. Our criteria to select reviewers were a proven publication record in the top computer vision conferences and journals and a completed (or close to completed) doctoral degree. The original list of reviewers was extended by few additional reviewers recommended by the ACs to add expertise for papers where appropriate reviewers were not available.

As in previous years, paper submission, matching, review, and decision were handled using Microsoft's Conference Management Toolkit (CMT) system, and paper-to-reviewer matching scores were computed using the Toronto Paper Matching System (TPMS). However, the following key innovations to the review process were introduced. (1) With the help of Andrew McCallum's team and the support of the Computer Vision Foundation (CVF), we introduced Researcher.cc, a new conflict management system that automatically mines institutional, co-author, and advisor-advisee conflicts, while at the same time allowing for user input. (2) We asked reviewers to bid for the papers they wanted to review, and used these bids in conjunction with TPMS scores to suggest reviewers to ACs. As a result, the assignment of papers to reviewers was based not only on AC suggestions, but also on reviewers' bids. (3) Instead of assigning each paper to one primary AC, who then discussed the paper with one or more secondary ACs, we assigned each paper to two primary ACs who independently assessed the reviews and recommended acceptance or rejection (as done in ICCV 2011). In case of disagreement, anonymous discussions between the two ACs were conducted to reach a consensus. If a consensus was not reached, a third AC independently assessed the reviews and broke the tie. A third AC was also assigned to papers where the ACs' decision was different from a unanimous reviewers' decision. In this way, all decisions were made by ACs using CMT, without the need for a physical AC meeting. The ACs also recommended 16 papers for awards, which were sent to the Marr Prize Committee, which selected the winners in a conflict free manner and independently from the PCs and GCs. (4) We used paper-to-paper matching scores to detect similar submissions and assign them to the same ACs and reviewers. The same scores were also used to detect potential double submissions. (5) Prior to the rebuttal phase, papers for which reviewers and ACs unanimously recommended rejection were early rejected, allowing authors to resubmit the work to other venues well before the final decisions were announced. (6) During the rebuttal phase, authors were allowed to submit a revised PDF that addressed the reviewer's comments.

To make the decision process as comprehensible as possible, the PCs checked all consolidation reports for quality and requested additional explanations from

Message from the General and Program Chairs

the ACs in a few cases. The PCs also invested significant effort in detecting and discussing possible cases of plagiarism, self-plagiarism and double submissions, involving the ACs and reviewers when needed. As a result, a number of papers were desk-rejected, and the most severe cases were reported to the IEEE.

The PCs did not submit any papers, allowing them to work without any direct conflicts throughout the review process. This year, General Chairs (GCs) were allowed to submit papers, and therefore did not have any software access to the CMT system beyond that of an author. Additionally, ACs were excluded from any decisions associated with papers from their research groups, affiliated institutions, or collaborators. The double-blind nature of the ICCV review process was thus strictly maintained throughout.

The proceedings of ICCV 2015, which include all papers in the main conference and associated workshops, have been published in the CVF website and are being provided on USB drives at the conference. The papers will also be indexed by the IEEE and made available through the IEEE Computer Society Digital Library and IEEE Xplore.

We wish to thank all members of the Organizing Committee, ACs, reviewers, and authors. A special thanks to Nicole Finn and her team for managing the conference organization; ICCV 2015 would not have happened without them. We also wish to thank Laurent Charlin, Ari Kobren, Colin Lea and the CMT team for providing critical technical assistance with TPMS, Researcher.cc, CMT and various other software used to run the conference. Their immense amount of hard work and professionalism has made ICCV 2015 a first-rate conference. Our thanks also go to the organizers of previous conferences for their helpful advice and support. Finally, we are extremely grateful to all of the sponsors of ICCV 2015.

In closing, we wish all the attendees a highly stimulating and informative conference, and an enjoyable stay in Santiago de Chile.

General Chairs: ***Ruzena Bajcsy, Greg Hager, Yi Ma***

Program Chairs: ***Katsushi Ikeuchi, Christoph Schnörr, Josef Sivic, René Vidal***

ICCV 2015 Organizing Committee

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Tomas Werner
Lior Wolf
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Ying Wu
Jianxin Wu
Ming-Hsuan Yang
Allen Yang
Jingyi Yu
Song-Chun Zhu
Larry Zitnick

ICCV 2015 Outstanding Reviewers

We are pleased to recognize the following researchers as "ICCV 2015 Outstanding Reviewers". These reviewers were identified by one or more of the ICCV Area Chairs for their hard work in providing high quality and detailed reviews for their assigned papers.

Relja Arandjelovic
Antonis Argyros
Moshe Ben-ezra
Ohad Ben-Shahar
Carlos Benitez-Quiroz
Arnav Bhavsar
Oliver Cossairt
Marco Cristani
Alessio Del Bue
Mark Drew
Alexei Efros
Ross Girshick
Ioannis Gkioulekas
Daniel Glasner
Saurabh Gupta
Mehrtash Harandi
Kaiming He
Joao Henriques
Derek Hoiem
Anthony Hoogs
Ichiro Ide
Ivo Ihrke
Suyog Jain
C.V. Jawahar
Yannis Kalantidis
Margret Keuper
Martin Kleinsteuber
Kyros Kutulakos
Pierre-Yves Laffont
Ivan Laptev
Clement Mallet
Vlad Morariu
Vittorio Murino
Naila Murray
Alison Noble
Guillaume Obozinski
Bjorn Ommer
Martin R. Oswald
Wanli Ouyang
Tomas Pajdla
In Kyu Park
Vladimir Pavlovic
Bojan Pepik
Marc Pollefeys
Jordi Pont-Tuset
Guo-Jun Qi
Deva Ramanan
Sebastian Ramos
Jerome Revaud
Elisa Ricci
Emanuele Rodola
Samuel Rota Bulò
Stefan Roth
Sudeep Sarkar
Torsten Sattler
Mubarak Shah
Gaurav Sharma
Yusuke Sugano
Sinisa Todorovic
Akihiko Torii
Roberto Tron
Richard Wildes
David Wipf
Tianfu Wu
Jonas Wulff
Li Xu
Qingxiong Yang
Yinqiang Zheng

Friday, December 11

NOTE: Tutorials and workshops are in the Marriott Hotel and Courtyard Hotel. The room assignments are for the Marriott Hotel unless otherwise noted.

0730–1800 Registration (Foyer Plaza Gacitua)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

Computer Vision for Autonomous Driving

Organizer: Sebastian Ramos
Markus Enzweiler
Michael James
Will Maddern
Elmar Mair
Jonas Witt
Geoff Ballew

Time: 0830-1800 (Full Day)

Location: Salon D-E

Description: Autonomous vehicles started as a distant dream just a few decades ago. However, thanks to the recent great progress made in many fields of computer science and engineering, this dream is now becoming reality. Autonomous vehicles will revolutionize our society by improving our current mobility models, and most importantly, by radically reducing the number of road fatalities. In particular, computer vision plays a central role in the perception and understanding capabilities that these vehicles required to be able to correctly operate not only under standard conditions, but also at the most unexpected situations. This tutorial's goal is to present the concrete modules needed to build a vision system suitable for autonomous vehicles. We will also present an overview of the recent history of autonomous driving technologies and a summary of the current challenges and perspectives from the academy and industry regarding this problem.

From Statistical Image Processing to Probabilistic Deep Learning

Organizers: Iasonas Kokkinos
George Papandreou

Time: 0830-1800 (Full Day)

Location: Alamo A-B (Courtyard Hotel)

Description: The goal of this tutorial is to elaborate on the ties between probabilistic approaches to deep learning and traditional methods from statistical signal processing and statistical data modeling. *Our aim is to provide the background necessary to make a larger part of probabilistic deep learning accessible to starting graduate students with an electrical engineering and/or computer science background.*

In particular, flat, single-layer probabilistic models have been extensively studied in image processing, computer vision and machine learning, and in several cases come equipped with exact methods for inference and learning; for instance linear models with or without sparsity constraints often lead to analytic Maximum-a-Posteriori solutions, as e.g. in the case of Wiener filters, while Maximum Entropy parameter estimation for the exponential family leads to convex optimization problems with unique solutions. As such, understanding such models is easier and provides a solid background on which to develop intuition for deeper and less tractable models.

For this, we will approach deep generative models from a statistical image modeling perspective, starting from linear models, moving on to Boltzmann-Gibbs distributions, Markov Random Fields, and Restricted Boltzmann Machines, leading up to Deep Belief Networks and Deep Boltzmann Machines. We will finally present non-probabilistic deep relaxations such as convolutional neural networks and stacked auto-encoders while exploiting the intuitions developed from probabilistic modeling.

Removing Camera Blur: Tricks of the Trade, Insights and Applications

Organizer: Paolo Favaro
David Wipf
Jue Wang
Filip Sroubek

Time: 0830-1230 (Half Day — Morning)

Location: Salon A-B

Description: This tutorial aims at introducing motion deblurring to beginning graduate students and engineers in industry. The main objective is to illustrate how the blur removal problem can be cast, what has been achieved so far, what we really know about blind deconvolution problems in general, and what the next challenges are. Overall we envision that investigation of these topics can lead to enhancements, extensions, and more transparent deployment of Bayesian-inspired algorithms both for blind deblurring problems and beyond. Also, the underlying insights carry over to a wide variety of bilinear models common in the computer vision literature such as independent component analysis, dictionary learning/sparse coding, and non-negative matrix factorization, just to name a few.

How to Build a Digital Human Body

Organizer: Michael Black
Matthew Loper
Javier Romero
Gerard Pons-Moll
Naureen Mahmood
Federica Bogo

Time: 0830-1230 (Half Day — Morning)

Location: Salon G

Description: Human body models play an important role in human pose detection, tracking, and activity analysis. Such models are also useful for training machine learning methods for pose/shape estimation. Previously, highly accurate models were either not available or not practical for computer vision. In this workshop we take participants through the recent history and the concrete steps needed to build a high quality model. The tutorial covers data capture/scanning, mesh alignments, shape representation, soft-tissue motion, pose/shape estimation, pose/shape from RGB-D, and applications in medicine, psychology, VR, animation, fashion. Attendees will walk away with a 3D body model that they can readily use for their own research purposes. The tutorial is taught by a team of researchers from the Max Planck Institute for Intelligent Systems, who have extensive experience in 3D body modeling in vision, graphics, and machine learning.

Solving Minimal Problems

Organizers: Tomas Pajdla
Zuzana Kukelova
Kalle Astrom
Lurent Kneip
Changchang Wu

Time: 1400-1800 (Half Day — Afternoon)

Location: Salon A-B

Description: Minimal problems play an important role in 3D reconstruction and Visual Odometry computation. The state of the art approach to minimal problem solving is based on solving polynomial equations robustly and efficiently. This is a difficult topic since it is often formulated in a very abstract mathematical language. Our goal is to explain the principles and the practice of minimal problem solving to allow engineering to use the most useful methods that have been developed in last ten years. We will present and practically demonstrate how to formulate and solve minimal problems with tools available on pre-configured software that will be distributed to the participants of the tutorial.

Tools for Efficient Object Detection

Organizers: Rogerio Feris
Piotr Dollar
Xiaoyu Wang
Kaiming He
Ross Girshick
Rodrigo Benenson

Time: 1400-1800 (Half Day — Afternoon)

Location: Salon G

Description: In many real-world applications, running a fast object detector is as critical as running an accurate object detector. Significant progress has been made in the past few years to boost the accuracy levels of both image classification and object detection, but existing solutions often rely on computationally expensive models, which are prohibitively slow for numerous applications. Building a fast object detector is also challenging due to the large number of image sub-windows that usually need to be scanned in order to localize objects in the image. The goal of this tutorial is to present a set of modern tools for efficient and accurate object detection. We will cover emerging topics such as region proposals, fast feature pyramids, and state-of-the-art detectors based on fast extraction of Convolutional Neural Network (CNN) features. The organizers will also share their experience in building real-time systems through hands-on sessions based on publicly available source code

Computational Time of Flight Imaging

Organizers: Mohit Gupta
Ramesh Raskar
Achuta Kadambi
Ayush Bhandari

Time: 1400-1800 (Half Day — Afternoon)

Location: Alamo C (Courtyard Hotel)

Description: Time-of-flight (ToF) cameras are fast becoming the method of choice for depth sensing in a wide range of applications. Several low cost and compact ToF systems are available as commodity devices, including the Microsoft Kinect and the Intel SoftKinectic sensors. In addition to depth recovery, ToF cameras are also being re-purposed for recovering a variety of scene information, such as reflectance properties and intra-scene light transport. This tutorial introduces our audience to recent advances made in the field of ToF imaging, including a discussion on the core challenges faced by ToF cameras and existing solutions, novel applications such as transient imaging, measuring depths around the corners and estimating fluorescence and material properties. We will conclude the tutorial by providing guidelines to build programmable, low cost and off-the-shelf ToF imaging systems, to encourage reproducibility within the vision community.

Video Summarization for Large-scale Analytics

Organizers: Kannappan Palaniappan
Sharath Pankanti
Guna Seetharaman

Location: Tacora

Schedule: Full Day

0800 **Opening Remarks**

0815 **Invited Talk:** Hierarchical Union-of-Subspaces Model for Human Activity Summarization, *Raghuveer M. Rao (Army Research Lab)*

0900 Morning Break

0930 **Invited Talk:** What Do 30000 Webcams Tell Us About How We Live? *Robert Pless (Washington Univ.)*

1015 **Invited Talk:** WAMI and Scalable Event Recognition, *Gérard Medioni (Univ. of Southern California)*

1100 **Invited Talk:** A Scalable Architecture for Operational FMV Exploitation, *William R. Thissell (Los Alamos National Laboratory)*

1145 Lunch (on your own)

1315 **Invited Talk:** TBA, *Ali Chaudhry (SRI International)*

1400 **Invited Talk:** Geotagging at Scale, Social Linkage, *Jiebo Luo (Univ. of Rochester)*

1445 Afternoon Break

1530 Video Summarization via Segments Summary Graphs, *Mahmut Demir, H. Isil Bozma*

1550 Towards Large-Scale Face Recognition Based on Videos, *Meltem Yalcin, Hakan Cevikalp, Hasan Serhan Yavuz*

1610 Fast Structure from Motion for Sequential and Wide Area Motion Imagery, *Hadi AliAkbarpour, Kannappan Palaniappan, Guna Seetharaman*

1630 **Closing Remarks**

Computer Vision for Affective Computing

Organizers: Abhinav Dhall
Roland Goecke
Simon Lucey
Nicu Sebe

Location: Salon C

Schedule: Half Day — Morning

0840 **Introduction**

0845 **Keynote Talk:** Affect-Driven Human Computer Interaction, *Qiang Ji (Rensselaer Polytechnic Institute)*

0945 Facial Micro-Expression Recognition Using Spatiotemporal Local Binary Pattern With Integral Projection, *Xiaohua Huang, Su-Jing Wang, Guoying Zhao, Matti Piteikäinen*

1000 Morning Break

1030 Facial Action Unit Detection Using Active Learning and an Efficient Non-Linear Kernel Approximation, *Thibaud Senechal, Daniel McDuff, Rana el Kaliouby*

1045 Do Deep Neural Networks Learn Facial Action Units When Doing Expression Recognition?, *Pooya Khorrami, Thomas Le Paine, Thomas S. Huang*

1100 FaceCept3D: Real Time 3D Face Tracking and Analysis, *Sergey Tulyakov, Radu-Laurentiu Vieriu, Enver Sangineto, Nicu Sebe*

1115 From Emotions to Action Units With Hidden and Semi-Hidden-Task Learning, *Adrià Ruiz, Joost Van de Weijer, Xavier Binefa (in ICCV 2015)*

1130 **Keynote Talk:** TBA, *Shiguang Shan (Chinese Academy of Sciences)*

1230 Multi-Conditional Latent Variable Model for Joint Facial Action Unit Detection, *Stefanos Eleftheriadis, Ognjen Rudovic, Maja Pantic (in ICCV 2015)*

Color and Photometry in Computer Vision

Organizers: Theo Gevers
José M. Álvarez
Joost van de Weijer
Arjan Gijsenij

Location: Marriott Gallery

Schedule: Half Day — Morning

S1: Keynote Session 1 (0845-0930)

0845 **Opening Remarks**

0900 **Invited Speaker:** Color and Commodity Cameras: The Good, the Bad, and the Ugly, *Michael S. Brown (National Univ. of Singapore)*

S2: Oral Session 1 (0930-1010)

0930 Metamer Mismatching and Its Consequences for Predicting How Colours Are Affected by the Illuminant, *Xiandou Zhang, Brian Funt, Hamidreza Mirzaei*

0950 HDR Recovery Under Rolling Shutter Distortions, *Sheetal B. Gupta, A. N. Rajagopalan, Gunasekaran Seetharaman*

1010 Morning Break

S3: Keynote Session 2 (1030–1110)

1030 **Invited Speaker:** Intrinsic Videos and the Bilateral Filter, *Peter Gehler (University of Tübingen)*

S4: Oral Session 2 (1110-1210)

1110 A Hybrid Strategy for Illuminant Estimation Targeting Hard Images, *Roshanak Zakizadeh, Michael S. Brown, Graham D. Finlayson*

1130 Learning a Deep Convolutional Network for Light-Field Image Super-Resolution, *Youngjin Yoon, Hae-Gon Jeon, Donggeun Yoo, Joon-Young Lee, In So Kweon*

1150 N-to-SRGB Mapping for Single-Sensor Multispectral Imaging, *Yusuke Monno, Masayuki Tanaka, Masatoshi Okutomi*

3D Scene Understanding

Organizers: Markus Enzweiler
Sebastian Ramos
Michael Yang
Raquel Urtasun
Nick Barnes
Caroline Pantofaru

Location: Marriott Gallery

Schedule: Half Day — Afternoon

1315 **Opening Remarks**

1320 **Invited Talk:** Object Detection, Pose Estimation and Semantic Segmentation Using 3D Wireframe Models, *René Vidal (Jhons Hopkings Univ.)*

1410 **Invited Talk:** Towards 3D Visual Scene Understanding, *Bernt Schiele (Max-Planck-Institut für Informatik)*

1500 Afternoon Break & Poster Session

1600 **Invited Talk:** 3D Indoor Scene Understanding, *Sanja Fidler (Univ. of Toronto)*

1650 **Invited Talk:** Exploiting Structure for Single Image 3D Scene Understanding, *Abhinav Gupta (Carnegie Mellon Univ.)*

1740 **Closing Remarks**

Forensics Applications of Computer Vision and Pattern Recognition

Organizers: P. Jonathon Phillips
Kevin Bowyer
Claudio Perez
Domingo Mery

Location: Salon C

Schedule: Half Day — Afternoon

1400 **Opening Remarks**

1415 Learning-Based Information Fusion for Fully Automatic MRI Age Estimation, *Darko Stern, Martin Urschler*

1440 Multi-Person Tracking by Online Learned Grouping Model With Non-linear Motion Context, *Xiaojing Chen, Bir Bhanu*

1505 Digital (or Touch-Less) Fingerprint Lifting Using Structured Light, *Saleh Mosaddegh, Laurent Condat*

1530 Afternoon break

1600 Blur Adaptive Sparse Representation of Random Patches for Face Recognition on Blurred Images, *Daniel Heinsohn, Domingo Mery*

1525 On Accuracy Estimation in Face Biometric Problems, *Domingo Mery, Y. Zhao, Kevin W. Bowyer*

1650 Efficient Face Search using Coordinated Local Metric Learning, *Shreyas Saxena, Jakob Verbeek*

1725 Gender Classification on Face Images Under Challenging Conditions of Occlusions, Low Quality and Unconstrained Environments, *Juan Tapia, Carlos Aravena, Daniel Schulz, Claudio Perez*

1750 **Roundtable Discussion:** "Future Directions in Forensic Analysis and Computer Vision"

Transferring and Adapting Source Knowledge in Computer Vision

Organizers: Antonio M. López
Francesco Orabona
Tatiana Tommasi
Hugo Larochelle
Erik Rodner
David Vázquez
Jiaolong Xu

Location: Salon F

Schedule: Half Day — Afternoon

1400 **Welcome**

1405 **Invited Talk:** Domain Samples Shifting with Auto Encoder Network for Unsupervised Domain Adaptation, *Meina Kan (Chinese Academy of Sciences)*

1445 **Spotlights of Posters**

1505 Afternoon Break & Posters

- Beyond Photo-Domain Object Recognition: Benchmarks for the Cross-Depiction Problem, *Hongping Cai, Qi Wu, Peter Hall*
- Adapted Domain Specific Class Means, *Gabriela Csurka, Boris Chidlovskii, Stéphane Clinchant*
- Anatomical Landmark Detection in Medical Applications Driven by Synthetic Data, *Gernot Riegler, Martin Urschler, Matthias Rüther, Horst Bischof, Darko Stern*
- Bilinear CNN Models for Fine-Grained Visual Recognition, *Tsung-Yu Lin, Aruni Roy Chowdhury, Subhransu Maji*
- Return of Frustratingly Easy Domain Adaptation, *Baochen Sun, Jiashi Feng, Kate Saenko*
- Domain Generalization for Object Recognition With Multi-Task Autoencoders, *Muhammad Ghifary, W. Bastiaan Kleijn, Mengjie Zhang, David Balduzzi*
- Learning to Transfer: Transferring Latent Task Structures and Its Application to Person-Specific Facial Action Unit Detection, *Timur Almaev, Brais Martinez, Michel Valstar*
- Unsupervised Domain Adaptation for Zero-Shot Learning, *Elyor Kodirov, Tao Xiang, Zhenyong Fu, Shaogang Gong*

1625 **Invited Talk:** Adapting Deep Networks Across Domains, Modalities, and Tasks, *Judy Hoffman (Univ. of California, Berkeley)*

1705 **Invited Talk:** Deep Model Adaptation Using Domain-Adversarial Training, *Victor Lempitsky (Skolkovo Institute of Science and Technology)*

1745 **Invited Talk:** Domain Adaptation in a Deep Learning Contex, *Tinne Tuytelaars (K.U. Leuven)*

1825 **Best Paper Announcement & Closing Remarks**

Computer Vision for Accessible and Affordable HealthCare

Organizers: George Leifman
Ashok Veeraraghavan
Ramesh Raskar

Location: Maipo

Schedule: Half Day — Afternoon

1315 **Welcome Message**

1330 **Invited Talk:** Computer Vision in Medication Adherence: Lessons Learned and Research Challenges, *Alex Jaimes (AiCure)*

1400 **Invited Talk:** Gauss Surgical: From Vim to the FDA, *Siddarth Satish (Gauss Surgical)*

1430 **Invited Talk:** Cardiac Interventions Using Ultrasound and Augmented Reality, *Terry Peters (Western University)*

1500 Posters and Demos & Afternoon Break

1600 **Invited Talk:** Video Magnification for Healthcare, *Neal Wadhwa, MIT)*

1630 **Invited Talk:** Early Detection of Systemic Diseases Using Retina Image Processing, *Shyam Vasudevarao, Forus Health)*

Saturday, December 12

NOTE: Tutorials and workshops are in the Marriott Hotel and Courtyard Hotel. The room assignments are for the Marriott Hotel unless otherwise noted.

0730–1800 Registration (Foyer Plaza Gacitua)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

Inference and Learning in Discrete Graphical Models: Theory & Practice

Organizer: Bogdan Savchynskyy
Joerg Kappes
Thorsten Beier
Sebastian Nowozin
Carsten Rother

Time: 0830-1800 (Full Day)

Location: Sierra Nevada

Description: Discrete energy minimization problems, in the form of factor graphs, Markov or Conditional Random Field models (MRF/CRF) are a mainstay of computer vision research. Their applications range from image denoising, segmentation, motion estimation and stereo to object recognition and image editing. The aim of this tutorial is to give researchers a clear guidance, which type of models are tractable and which optimization methods are best suited for these models. Besides theoretical aspects we will focus on practical questions, in particular on an optimization aware modeling.

Learning Deep Structured Models

Organizer: Alexander Schwing
Raquel Urtasun

Time: 0830-1230 (Half Day — Morning)

Location: Alamo Ballroom (Courtyard Hotel)

Description: Deep learning and structured prediction methods such as conditional random fields and structured support vector machines are among the most important tools in computer vision. Within this tutorial we show how to derive and setup a theoretically sound unifying framework which contains standard algorithms for deep learning and typical methods for structured prediction as special cases. To illustrate the connection between the discussed tools we cover not only the basics for deep learning and structured prediction, but also a range of important techniques for inference using structured distributions. We demonstrate the applicability of the presented algorithms for a variety of tasks from image classification to semantic segmentation.

Mathematics of Deep Learning

Organizers: René Vidal
Joan Bruna
Guillermo Sapiro

Time: 1400-1800 (Half Day — Afternoon)

Location: Alamo Ballroom (Courtyard Hotel)

Description: The past five years have seen a dramatic increase in the performance of recognition systems due to the introduction of deep architectures for feature learning and classification. However, the mathematical reasons for this success remain elusive. This tutorial will review recent work that aims to provide a mathematical justification for properties of special classes of deep networks, such as global optimality, invariance, and stability of the learned representations.

Computer Vision for Road Scene Understanding & Autonomous Driving

Organizers: Mathieu Salzmann
Lars Petersson
José M. Álvarez

Location: Salon A-B

Schedule: Full Day

0830 **Keynote Talk:** *Andreas Geiger (Max Planck Institute for Intelligent Systems)*

S1: Oral Session 1 (0930-1000)

0930 Position Interpolation Using Feature Point Scale for Decimeter Visual Localization, *David Wong, Daisuke Deguchi, Ichiro Ide, Hiroshi Murase*

0940 Direct Visual Localisation and Calibration for Road Vehicles in Changing City Environments, *Geoffrey Pascoe, William Maddern, Paul Newman*

0950 The Statistics of Driving Sequences — And What We Can Learn From Them, *Henry Bradler, Birthe Anne Wiegand, Rudolf Mester*

1000 Morning Break

1030 **Keynote Talk:** *Jesse Levinson (Zoox Labs Inc.)*

S2: Oral Session 2 (1130-1210)

1130 Latent Hierarchical Part Based Models for Road Scene Understanding, *Suhas Kashetty Venkateshkumar, Muralikrishna Sridhar, Patrick Ott*

1140 Semantic Mapping of Large-Scale Outdoor Scenes for Autonomous Off-Road Driving, *Fernando Bernuy, Javier Ruiz del Solar*

1150 Sequential Score Adaptation With Extreme Value Theory for Robust Railway Track Inspection, *Xavier Gibert, Vishal M. Patel, Rama Chellappa*

1200 Goal-Directed Pedestrian Prediction, *Eike Rehder, Horst Kloeden*

1210 Lunch (on your own)

1400 **Keynote Talk:** *Joerg Schlinkheider, (Volkswagen)*

1500 Afternoon Break

1400 **Keynote Talk:** *Denis Wolf, (Univ. of Sao Paulo)*

1630 **Poster Session**

Multi-Sensor Fusion for Dynamic Scene Understanding

Organizers: Rama Chellappa
Christian Heipke
Alper Yilmaz
Clément Mallet
Michael Ying Yang
Yury Vizilter

Location: Salon C

Schedule: Full Day

0820 **Introduction,** *Michael Yang (TU Dresden)*

0830 **Keynote Talk:** Direct and Dense 3D Reconstruction from Autonomous Quadrotors, *Daniel Cremers (Technische Universität München)*

0930 Fusion of Inertial and Visual Measurements for RGB-D SLAM on Mobile Devices, *Nicholas Brunetto, Samuele Salti, Nicola Fioraio, Tommaso Cavallari, Luigi Di Stefano*

1000 Morning Break

1030 Incremental Division of Very Large Point Clouds for Scalable 3D Surface Reconstruction, *Andreas Kuhn, Helmut Mayer*

1100 Video Event Recognition by Combining HDP and Gaussian Process, *Wentong Liao, Bodo Rosenhahn, Machael Ying Yang*

1130 Surface Recovery: Fusion of Image and Point Cloud, *Siavash Hosseinyalamdary, Alper Yilmaz*

1200 Lunch Break (on your own)

1400 **Keynote Talk:** TBA, *Xiaogang Wang (Chinese Univ. of Hong-Kong)*

1500 Afternoon Break

1530 **Keynote Talk:** TBA

1630 **Poster Session**

- Incremental Division of Very Large Point Clouds for Scalable 3D Surface Reconstruction, *Andreas Kuhn, Helmut Mayer*
- A Multi-View Pedestrian Tracking Method in an Uncalibrated Camera Network, *Domonkos Varga, Tamás Szirányi, Attila Kiss, László Spórás, László Havasi*

- A Modified Sequential Monte Carlo Bayesian Occupancy Filter Using Linear Opinion Pool for Grid Mapping, *Sang-Il Oh, Hang-Bong Kang*
- Fusion of Inertial and Visual Measurements for RGB-D SLAM on Mobile Devices, *Nicholas Brunetto, Samuele Salti, Nicola Fioraio, Tommaso Cavallari, Luigi Di Stefano*
- Video Event Recognition by Combining HDP and Gaussian Process, *Wentong Liao, Bodo Rosenhahn, Machael Ying Yang*
- Surface Recovery: Fusion of Image and Point Cloud, *Siavash Hosseinyalamdary, Alper Yilmaz*

Inverse Rendering

Organizers: Anita Sellent
Stefan Roth
Peter Gehler
Carsten Rother

Location: Salon D-E-F

Schedule: Full Day

0845 **Welcome and Introduction**, *Anita Sellent, Stefan Roth, Peter Gehler, Carsten Rother (Organizers)*

0920 **Invited Talk & Discussion:** TBA, *Kyros Kutulakos (Univ. of Toronto)*

1000 Morning Break

1030 **Invited Talk & Discussion:** Realtime Shape, Illumination, and Albedo From Time-Of-Flight: A Full Bayesian Treatment, *Sebastian Nowozin (Microsoft Research Cambridge)*

1110 **Invited Talk & Discussion:** TBA, *David Forsyth (Univ. of Illinois at Urbana-Champaign)*

1150 **Invited Talk & Discussion:** TBA, *Manmohan Chandraker (NEC)*

1230 Lunch Break (on your own)

1340 **Invited Talk & Discussion:** TBA, *Reinhard Klein (Univ. of Bonn)*

1420 **Invited Talk & Discussion:** TBA, *Vladlen Koltun (Intel)*

1500 Afternoon Break

1530 **Poster Session**

- Joint Estimation of Depth, Reflectance and Illumination for Depth Refinement, *Kichang Kim, Akihiko Torii, Masatoshi Okutomi*
- Bilayer Blind Deconvolution With the Light Field Camera, *Meiguang Jin, Paramanand Chandramouli, Paolo Favaro*
- Multi-Shot Deblurring for 3D Scenes, *M. Arun, A. N. Rajagopalan, Gunasekaran Seetharaman*
- Efficient and Robust Inverse Lighting of a Single Face Image Using Compressive Sensing, *Miguel Heredia Conde, Davoud Shahlaei, Volker Blanz, Otmar Loffeld*
- Scene Intrinsics and Depth From a Single Image, *Evan Shelhamer, Jonathan T. Barron, Trevor Darrell*

1630 **Invited Talk & Discussion:** Approximate Differentiable Rendering and Its Application to Human Pose and Shape Estimation, *Michael Black (MPI for Intelligent Systems)*

1710 **Discussion & Wrap Up**, *Anita Sellent, Stefan Roth, Peter Gehler, Carsten Rother (Organizers)*

ChaLearn Looking at People: Workshop and Competitions

Organizers: Sergio Escalera
Jordi Gonzàlez
Xavier Baró
Hugo J. Escalante
Isabelle Guyon

Location: Salon G

Schedule: Full Day

0845 **Opening:** Presentation of the Workshop

0900 **Invited Speaker:** *Rama Chellappa (Univ. of Maryland)*

S1: Challenge Results and Award Ceremony (0945-1000)

0945 ChaLearn Looking at People 2015: Apparent Age and Cultural Event Recognition Datasets and Results, *Sergio Escalera, Junior Fabian, Pablo Pardo, Xavier Baró, Jordi Gonzàlez, Hugo J. Escalante, Dusan Misevic, Ulrich Steiner, Isabelle Guyon*

1000 Morning Break

S2: Winners Apparent Age Estimation (1030-1115)

1030 **1st:** DEX: Deep EXpectation of Apparent Age From a Single Image, *Rasmus Rothe, Radu Timofte, Luc Van Gool*

1045 **2nd:** AgeNet: Deeply Learned Regressor and Classifier for Robust Apparent Age Estimation, *Xin Liu, Shaoxin Li, Meina Kan, Jie Zhang, Shuzhe Wu, Wenxian Liu, Hu Han, Shiguang Shan, Xilin Chen*

1100 **3rd:** A Study on Apparent Age Estimation, *Yu Zhu, Yan Li, Guowang Mu, Guodong Guo*

S3: Winners Cultural Event Recognition (1115-1215)

1115 **1st:** Exploiting Feature Hierarchies With Convolutional Neural Networks for Cultural Event Recognition, *Mengyi Liu, Xin Liu, Yan Li, Xilin Chen, Alexander G. Hauptmann, Shiguang Shan*

1130 **2nd:** Deep Spatial Pyramid Ensemble for Cultural Event Recognition, *Xiu-Shen Wei, Bin-Bin Gao, Jianxin Wu*

1145 **3rd:** Better Exploiting OS-CNNs for Better Event Recognition in Images, *Limin Wang, Zhe Wang, Sheng Guo, Yu Qiao*

1200 **4th:** DLDR: Deep Linear Discriminative Retrieval for Cultural Event Classification From a Single Image, *Rasmus Rothe, Radu Timofte, Luc Van Gool*

1215 **Invited Speaker:** *Jianxin Wu (Nanjing Univ.)*

1245 Lunch (on your own)

S4: Looking at Poses (1345-1445)

1345 Moving Poselets: A Discriminative and Interpretable Skeletal Motion Representation for Action Recognition, *Lingling Tao, René Vidal*

1400 Skeleton-Free Body Pose Estimation From Depth Images for Movement Analysis, *Ben Crabbe, Adeline Paiement, Sion Hannuna, Majid Mirmehdi*

1415 Motion Recognition Employing Multiple Kernel Learning of Fisher Vectors Using Local Skeleton Features, *Yusuke Goutsu, Wataru Takano, Yoshihiko Nakamura*

1430 Person Attribute Recognition With a Jointly-Trained Holistic CNN Model, *Patrick Sudowe, Hannah Spitzer, Bastian Leibe*

1445 **Invited Speaker:** *TBA (NVIDIA)*

1500 Afternoon Break

1530 **Invited Speaker:** *Caroline Pantofaru (Google Research)*

Session V: Age Estimation (1600-1645)

1600 **4th:** Deeply Learned Rich Coding for Cross-Dataset Facial Age Estimation, *Zhanghui Kuang, Chen Huang, Wei Zhang*

1615 **5th:** Deep Label Distribution Learning for Apparent Age Estimation, *Xu Yang, Bin-Bin Gao, Chao Xing, Zeng-Wei Huo, Xiu-Shen Wei, Ying Zhou, Jianxin Wu, Xin Geng*

1630 **6th:** Unconstrained Age Estimation With Deep Convolutional Neural Networks, *Rajeev Ranjan, Sabrina Zhou, Jun Cheng Chen, Amit Kumar, Azadeh Alavi, Vishal M. Patel, Rama Chellappa*

1645 **Invited Speaker:** *Larry Davis (Univ. of Maryland)*

Session VI: Looking at Faces (1715-1815)

1715 An End-To-End System for Unconstrained Face Verification With Deep Convolutional Neural Networks, *Jun-Cheng Chen, Rajeev Ranjan, Amit Kumar, Ching-Hui Chen, Vishal M. Patel, Rama Chellappa*

1730 Coordinated Local Metric Learning, *Shreyas Saxena, Jakob Verbeek*

1745 Facial Landmark Localization in Depth Images Using Supervised Ridge Descent, *Necati Cihan Camgöz, Vitomir Štruc, Berk Gokberk, Lale Akarun, Ahmet Alp Kindiroglu*

1800 When Face Recognition Meets With Deep Learning: An Evaluation of Convolutional Neural Networks for Face Recognition, *Guosheng Hu, Yongxin Yang, Dong Yi, Josef Kittler, William Christmas, Stan Z. Li, Timothy Hospedales*

1815 **Closing —** The COST Action iV&L Net IC1307: Challenges in Computer Vision and Natural Language

1820 Dinner Break

1900 **Hackaton Session:** Deep Learning for Cultural Event and Apparent Age Recognition

2200 End Hackaton

Assistive Computer Vision & Robotics

Organizers: Giovanni Maria Farinella
Marco Leo
Gérard G. Medioni
Mohan Trivedi

Location: Tacora

Schedule: Full Day

0830 **Opening Remarks and Overview**

0845 **Invited Speaker:** Analyzing Social Interactions Through Behavioral Imaging, *James M. Rehg (Georgia Institute of Technology)*

S1: Oral Session I (0930-100)

0930 Recognizing Personal Contexts From Egocentric Images, *Antonino Furnari, Giovanni M. Farinella, Sebastiano Battiato*

0945 An Evaluation of Supervised, Novelty-Based and Hybrid Approaches to Fall Detection Using Silmee Accelerometer Data, *Aneta Lisowska, Gavin Wheeler, Victor Ceballos Inza, Ian Poole*

1000 Morning Break

S2: Oral Session II (1030-1130)

1030 An Intuitive Mobility Aid for Visually Impaired People Based on Stereo Vision, *Tobias Schwarze, Martin Lauer, Manuel Schwaab, Michailas Romanovas, Sandra Böhm, Thomas Jürgensohn*

1045 Improving Indoor Mobility of the Visually Impaired With Depth-Based Spatial Sound, *Simon Blessenohl, Cecily Morrison, Antonio Criminisi, Jamie Shotton*

1100 Estimating Body Pose of Infants in Depth Images Using Random Ferns, *Nikolas Hesse, Gregor Stachowiak, Timo Breuer, Michael Arens*

1115 Accurate Human-Limb Segmentation in RGB-D Images for Intelligent Mobility Assistance Robots, *Siddhartha Chandra, Stavros Tsogkas, Iasonas Kokkinos*

1130 **Poster Session I**

Includes all the papers from Oral Sessions I & II.

- Summarizing While Recording: Context-Based Highlight Detection for Egocentric Videos, *Yen-Liang Lin, Vlad I. Morariu, Winston Hsu*
- Evaluating Real-Time Mirroring of Head Gestures Using Smart Glasses, *Juan R. Terven, Bogdan Raducanu, María-Elena Meza, Joaquín Salas*
- Visual Attention-Guided Approach to Monitoring of Medication Dispensing Using Multi-Location Feature Saliency Patterns, *Roman Palenichka, Ahmed Lakhssassi, Myroslav Palenichka*
- Saliency Detection Using Quaternion Sparse Reconstruction, *Yi Zeng, Yi Xu*

1215 Lunch (on your own)

S3: Oral Session III (1400-1500)

1400 Deep Learning of Mouth Shapes for Sign Language, *Oscar Koller, Hermann Ney, Richard Bowden*

1415 A Structured Committee for Food Recognition, *Niki Martinel, Claudio Piciarelli, Christian Micheloni, Gian Luca Foresti*

1430 Single-Frame Indexing for 3D Hand Pose Estimation, *Cassandra Carley, Carlo Tomasi*

1445 A Fast and Accurate Eye Tracker Using Stroboscopic Differential Lighting, *Frank H. Borsato, Fernando O. Aluani, Carlos H. Morimoto*

1500 Afternoon Break

S4: Oral Session IV (1530-1600)

1530 Quantifying Levodopa-Induced Dyskinesia Using Depth Camera, *Maria Dyshel, David Arkadir, Hagai Bergman, Daphna Weinshall*

1545 A Stereo Vision Approach for Cooperative Robotic Movement Therapy, *Benjamin Busam, Marco Esposito, Simon Che'Rose, Nassir Navab, Benjamin Frisch*

1600 **Poster Session II**

Includes all the papers from Oral Sessions III & IV.

- Head Nod Detection From a Full 3D Model, *Yiqiang Chen, Yu Yu, Jean-Marc Odobez*
- Automatic Emotion Recognition in Robot-Children Interaction for ASD Treatment, *Marco Leo, Marco Del Coco, Pierluigi Carcagnì, Cosimo Distante, Massimo Bernava, Giovanni Pioggia, Giuseppe Palestra*
- Fine-Grained Product Class Recognition for Assisted Shopping, *Marian George, Dejan Mircic, Gábor Sörös, Christian Floerkemeier, Friedemann Mattern*

- Pedestrian Detection via Mixture of CNN Experts and Thresholded Aggregated Channel Features, *Ankit Verma, Ramya Hebbalaguppe, Lovekesh Vig, Swagat Kumar, Ehtesham Hassan*

1645 **Invited Speaker:** Creating Machines that Augment Human Capabilities, *Gregory D. Hager (John Hopkins Univ.)*

1730 **Closing and Remarks**

Describing and Understanding Video & The Large Scale Movie Description Challenge

Organizers: Anna Rohrbach
Atousa Torabi
Marcus Rohrbach
Christopher Pal
Hugo Larochelle
Aaron Courville
Bernt Schiele

Location: Marriott Gallery

Schedule: Half Day — Morning

0825 **Welcome and Introduction**

0830 **Invited Talk:** Pushing the Limits: Questions, Captions and Stories, *Larry Zitnick (Microsoft Research)*

0900 The Large Scale Movie Description Challenge: Introduction & Results

0945 **Spotlight Presentation:** TBA

1000 Poster Session & Morning Break

- It's in the Bag: Stronger Supervision for Automated Face Labeling, *Omkar M. Parkhi, Esa Rahtu, Andrew Zisserman*
- Sequence to Sequence – Video to Text, *Subhashini Venugopalan, Marcus Rohrbach, Jeff Donahue, Raymond Mooney, Trevor Darrell, Kate Saenko*
- Objects2Action: Classifying and Localizing Actions Without Any Video Example, *Mihir Jain, Jan C. van Gemert, Thomas Mensink, Cees G. M. Snoek*
- Video Captioning With Ensembles of Recurrent Networks Based on Frame- and Video-Level Features, *Rakshith Shetty, Jorma Laaksonen*
- Large Scale Video Description With Coupled Recurrent Neural Network Unit, *Oliver Nina, Andres Rodriguez*
- More TBA

1100 **Invited Talk:** Sentence-Directed Video Object Co-Detection (From Egocentric Mobile-Robot Video), *Jeffrey M. Siskind (Purdue Univ.)*

1130 **Spotlight Presentation:** TBA

1145 **Spotlight Presentation:** TBA

1200 **Invited Talk:** Cross-Modal Embeddings of Video, *Jason J. Corso (Univ. of Michigan)*

Visual Object Tracking Challenge

Organizers: Matej Kristan
Aleš Leonardis
Jiři Matas
Michael Felsberg

Location: Marriott Gallery

Schedule: Half Day — Afternoon

S1: Session 1 (1300-1515)

1300 **Welcome and Opening Remarks**

1305 The Visual Object Tracking VOT2015 Challenge Results, *Matej Kristan, et al.*

1350 Presentation from the winners of the VOT challenge

1410 Scalable Kernel Correlation Filter With Sparse Feature Integration, *Andrés Solís Montero, Jochen Lang, Robert Laganière*

1430 **Keynote Talk:** Fast Correlation Filter Tracking - Tricks of the Trade, *João F. Henriques (Univ. of Coimbra)*

1515 Posters & Demos and Afternoon Break

- Joint Scale-Spatial Correlation Tracking With Adaptive Rotation Estimation, *Mengdan Zhang, Junliang Xing, Jin Gao, Xinchu Shi, Qiang Wang, Weiming Hu*
- Robust Visual Tracking by Exploiting the Historical Tracker Snapshots, *Jiatong Li, Zhibin Hong, Baojun Zhao*

- Multi-Template Scale-Adaptive Kernelized Correlation Filters, *Adel Bibi, Bernard Ghanem*
- Convolutional Features for Correlation Filter Based Visual Tracking, *Martin Danelljan, Gustav Häger, Fahad Shahbaz Khan, Michael Felsberg*
- Tracker Fusion on VOT Challenge: How Does It Perform and What Can We Learn About Single Trackers?, *Christian Bailer, Didier Stricker*
- Demos: TBA

S2: Session 2 (1630-1900)

1630 **Keynote Talk:** Semantic and Geometric Models in Visual Object Tracking, *Richard Bowden (Univ. of Surrey)*

1715 The Thermal Infrared Visual Object Tracking VOT-TIR2015 Challenge Results, *Michael Felsberg, et al.*

1735 Presentation from the winners of the VOT-TIR challenge

1755 Learning Spatially Regularized Correlation Filters for Visual Tracking, *Martin Danelljan, Gustav Häger, Fahad Shahbaz Khan, Michael Felsberg (in ICCV 2015)*

1815 **Panel Discussion**

1850 **Closing Remarks**

Sunday, December 13

0730–1800 Registration (Austral Courtyard)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

0830–0845 Welcome by the General & Program Chairs (Del Parque Grand Salon)

0845–0945 Oral Session O-1A: Vision & Language (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-1A.

Chairs: Devi Parikh *(Virginia Institute of Technology)*
Larry Zitnick *(Microsoft Research)*

Format (13 min. for presentation + 2 min. for questions)

1. Ask Your Neurons: A Neural-Based Approach to Answering Questions About Images, *Mateusz Malinowski, Marcus Rohrbach, Mario Fritz*
2. Segment-Phrase Table for Semantic Segmentation, Visual Entailment and Paraphrasing, *Hamid Izadinia, Fereshteh Sadeghi, Santosh K. Divvala, Hannaneh Hajishirzi, Yejin Choi, Ali Farhadi*
3. Aligning Books and Movies: Towards Story-Like Visual Explanations by Watching Movies and Reading Books, *Yukun Zhu, Ryan Kiros, Rich Zemel, Ruslan Salakhutdinov, Raquel Urtasun, Antonio Torralba, Sanja Fidler*
4. Learning Query and Image Similarities With Ranking Canonical Correlation Analysis, *Ting Yao, Tao Mei, Chong-Wah Ngo*

0945–1215 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-1A.

Available at: http://goo.gl/1uv1G2

0945–1215 Exhibits (Multi Purpose Area B)

- Amazon
- Datatang
- Facebook
- iRobot
- Microsoft
- Omron
- Panasonic
- Pinterest
- SenseTime
- Springer

0945–1215 Demos (Multi Purpose Area B)

- Scalable Color Sketch Based Search of Millions of Images, *Tu Bui, John Collomosse (Univ. of Surrey)*

0945–1030 Break (Ventisquero Courtyard and Foyer)

0945–1215 Poster Session P-1A: Recognition, Low-Level Vision, and Biomedical Image Analysis (Multi Purpose Area B)

1. Learning to See by Moving, *Pulkit Agrawal, Joao Carreira, Jitendra Malik*
2. Object Detection Using Generalization and Efficiency Balanced Co-Occurrence Features, *Haoyu Ren, Ze-Nian Li*
3. Mining And-Or Graphs for Graph Matching and Object Discovery, *Quanshi Zhang, Ying Nian Wu, Song-Chun Zhu*
4. Pose Induction for Novel Object Categories, *Shubham Tulsiani, João Carreira, Jitendra Malik*
5. Dynamic Texture Recognition via Orthogonal Tensor Dictionary Learning, *Yuhui Quan, Yan Huang, Hui Ji*
6. Convolutional Channel Features, *Bin Yang, Junjie Yan, Zhen Lei, Stan Z. Li*
7. Local Convolutional Features With Unsupervised Training for Image Retrieval, *Mattis Paulin, Matthijs Douze, Zaid Harchaoui, Julien Mairal, Florent Perronin, Cordelia Schmid*
8. RIDE: Reversal Invariant Descriptor Enhancement, *Lingxi Xie, Jingdong Wang, Weiyao Lin, Bo Zhang, Qi Tian*
9. Discrete Tabu Search for Graph Matching, *Kamil Adamczewski, Yumin Suh, Kyoung Mu Lee*
10. Discriminative Learning of Deep Convolutional Feature Point Descriptors, *Edgar Simo-Serra, Eduard Trulls, Luis Ferraz, Iasonas Kokkinos, Pascal Fua, Francesc Moreno-Noguer*

11. Amodal Completion and Size Constancy in Natural Scenes, *Abhishek Kar, Shubham Tulsiani, Joao Carreira, Jitendra Malik*
12. Learning Where to Position Parts in 3D, *Marco Pedersoli, Tinne Tuytelaars*
13. Query Adaptive Similarity Measure for RGB-D Object Recognition, *Yanhua Cheng, Rui Cai, Chi Zhang, Zhiwei Li, Xin Zhao, Kaiqi Huang, Yong Rui*
14. Listening With Your Eyes: Towards a Practical Visual Speech Recognition System Using Deep Boltzmann Machines, *Chao Sui, Mohammed Bennamoun, Roberto Togneri*
15. Cluster-Based Point Set Saliency, *Flora Ponjou Tasse, Jiri Kosinka, Neil Dodgson*
16. A Comprehensive Multi-Illuminant Dataset for Benchmarking of the Intrinsic Image Algorithms, *Shida Beigpour, Andreas Kolb, Sven Kunz*
17. PatchMatch-Based Automatic Lattice Detection for Near-Regular Textures, *Siying Liu, Tian-Tsong Ng, Kalyan Sunkavalli, Minh N. Do, Eli Shechtman, Nathan Carr*
18. A Data-Driven Metric for Comprehensive Evaluation of Saliency Models, *Jia Li, Changqun Xia, Yafei Song, Shu Fang, Xiaowu Chen*
19. A Matrix Decomposition Perspective to Multiple Graph Matching, *Junchi Yan, Hongteng Xu, Hongyuan Zha, Xiaokang Yang, Huanxi Liu, Stephen Chu*
20. Fast and Effective L_0 Gradient Minimization by Region Fusion, *Rang M. H. Nguyen, Michael S. Brown*
21. Generic Promotion of Diffusion-Based Salient Object Detection, *Peng Jiang, Nuno Vasconcelos, Jingliang Peng*
22. Nighttime Haze Removal With Glow and Multiple Light Colors, *Yu Li, Robby T. Tan, Michael S. Brown*
23. Conformal and Low-Rank Sparse Representation for Image Restoration, *Jianwei Li, Xiaowu Chen, Dongqing Zou, Bo Gao, Wei Teng*
24. Patch Group Based Nonlocal Self-Similarity Prior Learning for Image Denoising, *Jun Xu, Lei Zhang, Wangmeng Zuo, David Zhang, Xiangchu Feng*
25. Automatic Thumbnail Generation Based on Visual Representativeness and Foreground Recognizability, *Jingwei Huang, Huarong Chen, Bin Wang, Stephen Lin*
26. SALICON: Reducing the Semantic Gap in Saliency Prediction by Adapting Deep Neural Networks, *Xun Huang, Chengyao Shen, Xavier Boix, Qi Zhao*
27. A Novel Sparsity Measure for Tensor Recovery, *Qian Zhao, Deyu Meng, Xu Kong, Qi Xie, Wenfei Cao, Yao Wang, Zongben Xu*
28. Oriented Object Proposals, *Shengfeng He, Rynson W.H. Lau*
29. Learning Nonlinear Spectral Filters for Color Image Reconstruction, *Michael Moeller, Julia Diebold, Guy Gilboa, Daniel Cremers*
30. Beyond White: Ground Truth Colors for Color Constancy Correction, *Dongliang Cheng, Brian Price, Scott Cohen, Michael S. Brown*
31. RGB-Guided Hyperspectral Image Upsampling, *Hyeokhyen Kwon, Yu-Wing Tai*
32. Projection Onto the Manifold of Elongated Structures for Accurate Extraction, *Amos Sironi, Vincent Lepetit, Pascal Fua*
33. Naive Bayes Super-Resolution Forest, *Jordi Salvador, Eduardo Pérez-Pellitero*
34. POP Image Fusion - Derivative Domain Image Fusion Without Reintegration, *Graham D. Finlayson, Alex E. Hayes*
35. Adaptive Spatial-Spectral Dictionary Learning for Hyperspectral Image Denoising, *Ying Fu, Antony Lam, Imari Sato, Yoichi Sato*
36. Fully Connected Guided Image Filtering, *Longquan Dai, Mengke Yuan, Feihu Zhang, Xiaopeng Zhang*
37. Segment Graph Based Image Filtering: Fast Structure-Preserving Smoothing, *Feihu Zhang, Longquan Dai, Shiming Xiang, Xiaopeng Zhang*
38. Deep Networks for Image Super-Resolution With Sparse Prior, *Zhaowen Wang, Ding Liu, Jianchao Yang, Wei Han, Thomas Huang*
39. Convolutional Color Constancy, *Jonathan T. Barron*
40. Learning Ordinal Relationships for Mid-Level Vision, *Daniel Zoran, Phillip Isola, Dilip Krishnan, William T. Freeman*
41. Thin Structure Estimation With Curvature Regularization, *Dmitrii Marin, Yuchen Zhong, Maria Drangova, Yuri Boykov*
42. HARF: Hierarchy-Associated Rich Features for Salient Object Detection, *Wenbin Zou, Nikos Komodakis*
43. Deep Colorization, *Zezhou Cheng, Qingxiong Yang, Bin Sheng*
44. Image Matting With KL-Divergence Based Sparse Sampling, *Levent Karacan, Aykut Erdem, Erkut Erdem*

45. Intrinsic Decomposition of Image Sequences From Local Temporal Variations, *Pierre-Yves Laffont, Jean-Charles Bazin*
46. Low-Rank Tensor Approximation With Laplacian Scale Mixture Modeling for Multiframe Image Denoising, *Weisheng Dong, Guangyu Li, Guangming Shi, Xin Li, Yi Ma*
47. Learning Parametric Distributions for Image Super-Resolution: Where Patch Matching Meets Sparse Coding, *Yongbo Li, Weisheng Dong, Guangming Shi, Xuemei Xie*
48. Improving Image Restoration With Soft-Rounding, *Xing Mei, Honggang Qi, Bao-Gang Hu, Siwei Lyu*
49. See the Difference: Direct Pre-Image Reconstruction and Pose Estimation by Differentiating HOG, *Wei-Chen Chiu, Mario Fritz*
50. An Efficient Statistical Method for Image Noise Level Estimation, *Guangyong Chen, Fengyuan Zhu, Pheng Ann Heng*
51. Contour Detection and Characterization for Asynchronous Event Sensors, *Francisco Barranco, Ching L. Teo, Cornelia Fermüller, Yiannis Aloimonos*
52. Class-Specific Image Deblurring, *Saeed Anwar, Cong Phuoc Huynh, Fatih Porikli*
53. High-for-Low and Low-for-High: Efficient Boundary Detection From Deep Object Features and its Applications to High-Level Vision, *Gedas Bertasius, Jianbo Shi, Lorenzo Torresani*
54. Variational Depth Superresolution Using Example-Based Edge Representations, *David Ferstl, Matthias Rüther, Horst Bischof*
55. Conditioned Regression Models for Non-Blind Single Image Super-Resolution, *Gernot Riegler, Samuel Schulter, Matthias Rüther, Horst Bischof*
56. Video Super-Resolution via Deep Draft-Ensemble Learning, *Renjie Liao, Xin Tao, Ruiyu Li, Ziyang Ma, Jiaya Jia*
57. Pan-Sharpening With a Hyper-Laplacian Penalty, *Yiyong Jiang, Xinghao Ding, Delu Zeng, Yue Huang, John Paisley*
58. Video Restoration Against Yin-Yang Phasing, *Xiaolin Wu, Zhenhao Li, Xiaowei Deng*
59. Rolling Shutter Super-Resolution, *Abhijith Punnappurath, Vijay Rengarajan, A.N. Rajagopalan*
60. Learning Large-Scale Automatic Image Colorization, *Aditya Deshpande, Jason Rock, David Forsyth*
61. Compression Artifacts Reduction by a Deep Convolutional Network, *Chao Dong, Yubin Deng, Chen Change Loy, Xiaoou Tang*
62. Multiple-Hypothesis Affine Region Estimation With Anisotropic LoG Filters, *Takahiro Hasegawa, Mitsuru Ambai, Kohta Ishikawa, Gou Koutaki, Yuji Yamauchi, Takayoshi Yamashita, Hironobu Fujiyoshi*
63. A Self-Paced Multiple-Instance Learning Framework for Co-Saliency Detection, *Dingwen Zhang, Deyu Meng, Chao Li, Lu Jiang, Qian Zhao, Junwei Han*
64. External Patch Prior Guided Internal Clustering for Image Denoising, *Fei Chen, Lei Zhang, Huimin Yu*
65. Self-Calibration of Optical Lenses, *Michael Hirsch, Bernhard Schölkopf*
66. Illumination Robust Color Naming via Label Propagation, *Yuanliu liu, Zejian Yuan, Badong Chen, Jianru Xue, Nanning Zheng*
67. Unsupervised Cross-Modal Synthesis of Subject-Specific Scans, *Raviteja Vemulapalli, Hien Van Nguyen, Shaohua Kevin Zhou*
68. Learning to Boost Filamentary Structure Segmentation, *Lin Gu, Li Cheng*
69. Weakly-Supervised Structured Output Learning With Flexible and Latent Graphs Using High-Order Loss Functions, *Gustavo Carneiro, Tingying Peng, Christine Bayer, Nassir Navab*
70. Efficient Classifier Training to Minimize False Merges in Electron Microscopy Segmentation, *Toufiq Parag, Dan C. Ciresan, Alessandro Giusti*
71. On Statistical Analysis of Neuroimages With Imperfect Registration, *Won Hwa Kim, Sathya N. Ravi, Sterling C. Johnson, Ozioma C. Okonkwo, Vikas Singh*

1215–1315 **Plenary Session** (Del Parque Grand Salon)

- **Plenary Talk:** Convex Optimization with Abstract Linear Operators, *Stephen Boyd (Stanford Univ.)*
  Abstract: Domain specific languages (DSLs) for convex optimization, such as CVX and YALMIP and the more recent CVXPY and Convex.jl, are very widely used to rapidly develop, prototype, and solve convex optimization problems of modest size, say, tens of thousands of variables, with linear operators described as sparse matrices. These systems allow a user to specify a convex optimization

problem in a very succinct and natural way, and then solve the problem with great reliability, with no algorithm parameter tuning, and a reasonable performance loss compared to a custom solver hand designed and tuned for the problem. In this talk we describe recent progress toward the goal of extending these DSLs to handle large-scale problems that involve linear operators given as abstract operators with fast transforms, such as those arising in image processing and vision, medical imaging, and other application areas. This involves re-thinking the entire stack, from the high-level DSL design down to the low level solvers. This is is joint work by Stephen Boyd & Steven Diamond.

1315–1445 Lunch (On your own)

1445–1715 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-1B.

Available at: http://goo.gl/uYXkNS

1445–1715 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

1445–1715 Demos (Multi Purpose Area B)

- Impresee: Searching in Catalogs Using Photos and Sketches, *Juan Manuel Barrios, José Manuel Saavedra (Orand S.A.)*
- Robust Monocular SLAM for Augmented Reality, *Haomin Liu, Jinyu Li, Guofeng Zhang, Hujun Bao (Zhejiang Univ.)*

1445–1530 Break (Ventisquero Courtyard and Foyer)

1445–1715 Poster Session P-1B: Recognition and 3D Computer Vision I (Multi Purpose Area B)

1. Building Dynamic Cloud Maps From the Ground Up, *Calvin Murdock, Nathan Jacobs, Robert Pless*
2. A Versatile Learning-Based 3D Temporal Tracker: Scalable, Robust, Online, *David Joseph Tan, Federico Tombari, Slobodan Ilic, Nassir Navab*
3. Realtime Edge-Based Visual Odometry for a Monocular Camera, *Juan José Tarrio, Sol Pedre*
4. Fill and Transfer: A Simple Physics-Based Approach for Containability Reasoning, *Lap-Fai Yu, Noah Duncan, Sai-Kit Yeung*
5. On Linear Structure From Motion for Light Field Cameras, *Ole Johannsen, Antonin Sulc, Bastian Goldluecke*
6. 3D Object Reconstruction From Hand-Object Interactions, *Dimitrios Tzionas, Juergen Gall*
7. Minimal Solvers for 3D Geometry From Satellite Imagery, *Enliang Zheng, Ke Wang, Enrique Dunn, Jan-Michael Frahm*
8. An Efficient Minimal Solution for Multi-Camera Motion, *Jonathan Ventura, Clemens Arth, Vincent Lepetit*
9. Learning Shape, Motion and Elastic Models in Force Space, *Antonio Agudo, Francesc Moreno-Noguer*
10. A Versatile Scene Model With Differentiable Visibility Applied to Generative Pose Estimation, *Helge Rhodin, Nadia Robertini, Christian Richardt, Hans-Peter Seidel, Christian Theobalt*
11. Semantic Pose Using Deep Networks Trained on Synthetic RGB-D, *Jeremie Papon, Markus Schoeler*
12. Exploiting High Level Scene Cues in Stereo Reconstruction, *Simon Hadfield, Richard Bowden*
13. Point Triangulation Through Polyhedron Collapse Using the ℓ_∞ Norm, *Simon Donné, Bart Goossens, Wilfried Philips*
14. Optimizing the Viewing Graph for Structure-From-Motion, *Chris Sweeney, Torsten Sattler, Tobias Höllerer, Matthew Turk, Marc Pollefeys*
15. Intrinsic Scene Decomposition From RGB-D images, *Mohammed Hachama, Bernard Ghanem, Peter Wonka*
16. 3D Hand Pose Estimation Using Randomized Decision Forest With Segmentation Index Points, *Peiyi Li, Haibin Ling, Xi Li, Chunyuan Liao*
17. Accurate Camera Calibration Robust to Defocus Using a Smartphone, *Hyowon Ha, Yunsu Bok, Kyungdon Joo, Jiyoung Jung, In So Kweon*
18. High Quality Structure From Small Motion for Rolling Shutter Cameras, *Sunghoon Im, Hyowon Ha, Gyeongmin Choe, Hae-Gon Jeon, Kyungdon Joo, In So Kweon*
19. Photogeometric Scene Flow for High-Detail Dynamic 3D Reconstruction, *Paulo F. U. Gotardo, Tomas Simon, Yaser Sheikh, Iain Matthews*
20. Blur-Aware Disparity Estimation From Defocus Stereo Images, *Ching-Hui Chen, Hui Zhou, Timo Ahonen*
21. Global Structure-From-Motion by Similarity Averaging, *Zhaopeng Cui, Ping Tan*
22. Massively Parallel Multiview Stereopsis by Surface Normal Diffusion, *Silvano Galliani, Katrin Lasinger, Konrad Schindler*
23. Variational PatchMatch MultiView Reconstruction and Refinement, *Philipp Heise, Brian Jensen, Sebastian Klose, Alois Knoll*
24. As-Rigid-As-Possible Volumetric Shape-From-Template, *Shaifali Parashar, Daniel Pizarro, Adrien Bartoli, Toby Collins*

25. General Dynamic Scene Reconstruction From Multiple View Video, *Armin Mustafa, Hansung Kim, Jean-Yves Guillemaut, Adrian Hilton*
26. The Joint Image Handbook, *Matthew Trager, Martial Hebert, Jean Ponce*
27. Direct, Dense, and Deformable: Template-Based Non-Rigid 3D Reconstruction From RGB Video, *Rui Yu, Chris Russell, Neill D. F. Campbell, Lourdes Agapito*
28. Single Image Pop-Up From Discriminatively Learned Parts, *Menglong Zhu, Xiaowei Zhou, Kostas Daniilidis*
29. Learning Informative Edge Maps for Indoor Scene Layout Prediction, *Arun Mallya, Svetlana Lazebnik*
30. Multi-View Convolutional Neural Networks for 3D Shape Recognition, *Hang Su, Subhransu Maji, Evangelos Kalogerakis, Erik Learned-Miller*
31. Learning Analysis-by-Synthesis for 6D Pose Estimation in RGB-D Images, *Alexander Krull, Eric Brachmann, Frank Michel, Michael Ying Yang, Stefan Gumhold, Carsten Rother*
32. 3D Surface Profilometry Using Phase Shifting of De Bruijn Pattern, *Matea Đonlić, Tomislav Petković, Tomislav Pribanić*
33. A Deep Visual Correspondence Embedding Model for Stereo Matching Costs, *Zhuoyuan Chen, Xun Sun, Liang Wang, Yinan Yu, Chang Huang*
34. Learning Concept Embeddings With Combined Human-Machine Expertise, *Michael Wilber, Iljung S. Kwak, David Kriegman, Serge Belongie*
35. Deep Multi-Patch Aggregation Network for Image Style, Aesthetics, and Quality Estimation, *Xin Lu, Zhe Lin, Xiaohui Shen, Radomír Měch, James Z. Wang*
36. Towards Computational Baby Learning: A Weakly-Supervised Approach for Object Detection, *Xiaodan Liang, Si Liu, Yunchao Wei, Luoqi Liu, Liang Lin, Shuicheng Yan*
37. Improving Image Classification With Location Context, *Kevin Tang, Manohar Paluri, Li Fei-Fei, Rob Fergus, Lubomir Bourdev*
38. HICO: A Benchmark for Recognizing Human-Object Interactions in Images, *Yu-Wei Chao, Zhan Wang, Yugeng He, Jiaxuan Wang, Jia Deng*
39. Delving Deep into Rectifiers: Surpassing Human-Level Performance on ImageNet Classification, *Kaiming He, Xiangyu Zhang, Shaoqing Ren, Jian Sun*
40. Continuous Pose Estimation With a Spatial Ensemble of Fisher Regressors, *Michele Fenzi, Laura Leal-Taixé, Jörn Ostermann, Tinne Tuytelaars*
41. Adaptive Hashing for Fast Similarity Search, *Fatih Cakir, Stan Sclaroff*
42. Single Image 3D Without a Single 3D Image, *David F. Fouhey, Wajahat Hussain, Abhinav Gupta, Martial Hebert*
43. Cross-Domain Image Retrieval With a Dual Attribute-Aware Ranking Network, *Junshi Huang, Rogerio S. Feris, Qiang Chen, Shuicheng Yan*
44. Attribute-Graph: A Graph Based Approach to Image Ranking, *Nikita Prabhu, R. Venkatesh Babu*
45. Contextual Action Recognition With R*CNN, *Georgia Gkioxari, Ross Girshick, Jitendra Malik*
46. What Makes an Object Memorable?, *Rachit Dubey, Joshua Peterson, Aditya Khosla, Ming-Hsuan Yang, Bernard Ghanem*
47. *k*NN Hashing With Factorized Neighborhood Representation, *Kun Ding, Chunlei Huo, Bin Fan, Chunhong Pan*
48. Multi-View Complementary Hash Tables for Nearest Neighbor Search, *Xianglong Liu, Lei Huang, Cheng Deng, Jiwen Lu, Bo Lang*
49. Scalable Person Re-Identification: A Benchmark, *Liang Zheng, Liyue Shen, Lu Tian, Shengjin Wang, Jingdong Wang, Qi Tian*
50. MMSS: Multi-Modal Sharable and Specific Feature Learning for RGB-D Object Recognition, *Anran Wang, Jianfei Cai, Jiwen Lu, Tat-Jen Cham*
51. Object Detection via a Multi-Region and Semantic Segmentation-Aware CNN Model, *Spyros Gidaris, Nikos Komodakis*
52. Neural Activation Constellations: Unsupervised Part Model Discovery With Convolutional Networks, *Marcel Simon, Erik Rodner*
53. Cascaded Sparse Spatial Bins for Efficient and Effective Generic Object Detection, *David Novotny, Jiří Matas*
54. Probabilistic Label Relation Graphs With Ising Models, *Nan Ding, Jia Deng, Kevin P. Murphy, Hartmut Neven*
55. Predicting Good Features for Image Geo-Localization Using Per-Bundle VLAD, *Hyo Jin Kim, Enrique Dunn, Jan-Michael Frahm*

56. Task-Driven Feature Pooling for Image Classification, *Guo-Sen Xie, Xu-Yao Zhang, Xiangbo Shu, Shuicheng Yan, Cheng-Lin Liu*
57. Cutting Edge: Soft Correspondences in Multimodal Scene Parsing, *Sarah Taghavi Namin, Mohammad Najafi, Mathieu Salzmann, Lars Petersson*
58. One Shot Learning via Compositions of Meaningful Patches, *Alex Wong, Alan L. Yuille*
59. FASText: Efficient Unconstrained Scene Text Detector, *Michal Bušta, Lukáš Neumann, Jiří Matas*
60. Multi-Scale Recognition With DAG-CNNs, *Songfan Yang, Deva Ramanan*
61. Relaxed Multiple-Instance SVM With Application to Object Discovery, *Xinggang Wang, Zhuotun Zhu, Cong Yao, Xiang Bai*
62. Im2Calories: Towards an Automated Mobile Vision Food Diary, *Austin Meyers, Nick Johnston, Vivek Rathod, Anoop Korattikara, Alex Gorban, Nathan Silberman, Sergio Guadarrama, George Papandreou, Jonathan Huang, Kevin P. Murphy*
63. LEWIS: Latent Embeddings for Word Images and their Semantics, *Albert Gordo, Jon Almazán, Naila Murray, Florent Perronin*
64. Per-Sample Kernel Adaptation for Visual Recognition and Grouping, *Borislav Antic, Björn Ommer*
65. Fine-Grained Change Detection of Misaligned Scenes With Varied Illuminations, *Wei Feng, Fei-Peng Tian, Qian Zhang, Nan Zhang, Liang Wan, Jizhou Sun*
66. Aggregating Local Deep Features for Image Retrieval, *Artem Babenko, Victor Lempitsky*
67. Learning Deep Object Detectors From 3D Models, *Xingchao Peng, Baochen Sun, Karim Ali, Kate Saenko*
68. Harvesting Discriminative Meta Objects With Deep CNN Features for Scene Classification, *Ruobing Wu, Baoyuan Wang, Wenping Wang, Yizhou Yu*
69. Scalable Nonlinear Embeddings for Semantic Category-Based Image Retrieval, *Gaurav Sharma, Bernt Schiele*
70. Person Re-Identification Ranking Optimisation by Discriminant Context Information Analysis, *Jorge García, Niki Martinel, Christian Micheloni, Alfredo Gardel*
71. Unsupervised Generation of a Viewpoint Annotated Car Dataset From Videos, *Nima Sedaghat, Thomas Brox*

1715–1815 Oral Session O-1B: 3D Vision
(Del Parque Grand Salon)

Papers in this session are also in Poster Session P-1B.

Chairs: Adrian Hilton *(Univ. of Surrey)*
Hongdong Li *(Australian National Univ.)*

Format (13 min. for presentation + 2 min. for questions)

1. Structured Indoor Modeling, *Satoshi Ikehata, Hang Yang, Yasutaka Furukawa*
2. 3D Time-Lapse Reconstruction From Internet Photos, *Ricardo Martin-Brualla, David Gallup, Steven M. Seitz*
3. Global, Dense Multiscale Reconstruction for a Billion Points, *Benjamin Ummenhofer, Thomas Brox*
4. On the Visibility of Point Clouds, *Sagi Katz, Ayellet Tal*

Monday, December 14

0730–1800 Registration (Austral Courtyard)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

0830–1000 Oral Session O-2A: Segmentation, Edges and Saliency (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-2A.

Chairs: Jianbo Shi *(Univ. of Pennsylvania)*
Greg Shakhnarovich *(TTI Chicago)*

Format (13 min. for presentation + 2 min. for questions)

1. Weakly Supervised Graph Based Semantic Segmentation by Learning Communities of Image-Parts, *Niloufar Pourian, S. Karthikeyan, B.S. Manjunath*
2. Piecewise Flat Embedding for Image Segmentation, *Yizhou Yu, Chaowei Fang, Zicheng Liao*
3. Semantic Image Segmentation via Deep Parsing Network, *Ziwei Liu, Xiaoxiao Li, Ping Luo, Chen-Change Loy, Xiaoou Tang*
4. Human Parsing With Contextualized Convolutional Neural Network, *Xiaodan Liang, Chunyan Xu, Xiaohui Shen, Jianchao Yang, Si Liu, Jinhui Tang, Liang Lin, Shuicheng Yan*
5. Holistically-Nested Edge Detection, *Saining Xie, Zhuowen Tu*
6. Minimum Barrier Salient Object Detection at 80 FPS, *Jianming Zhang, Stan Sclaroff, Zhe Lin, Xiaohui Shen, Brian Price, Radomír Měch*

1000–1030 Break (Ventisquero Courtyard and Foyer)

1030–1200 Oral Session O-2B: Learning Representations & Attributes (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-2A.

Chairs: Alex Berg *(Univ. of North Carolina)*
Kate Saenko *(Univ. of Massachusetts, Lowell)*

Format (13 min. for presentation + 2 min. for questions)

1. Learning Image Representations Tied to Ego-Motion, *Dinesh Jayaraman, Kristen Grauman*
2. Unsupervised Visual Representation Learning by Context Prediction, *Carl Doersch, Abhinav Gupta, Alexei A. Efros*
3. Webly Supervised Learning of Convolutional Networks, *Xinlei Chen, Abhinav Gupta*
4. Fast R-CNN, *Ross Girshick*
5. Bilinear CNN Models for Fine-Grained Visual Recognition, *Tsung-Yu Lin, Aruni RoyChowdhury, Subhransu Maji*
6. Discovering the Spatial Extent of Relative Attributes, *Fanyi Xiao, Yong Jae Lee*

1200–1330 Lunch (On your own)

1330–1500 Oral Session O-2C: Statistical Methods & Learning (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-2A.

Chairs: Trevor Darrell *(UC Berkeley)*
Peter Gehler *(MPI for Intelligent Systems)*

Format (13 min. for presentation + 2 min. for questions)

1. Deep Neural Decision Forests, *Peter Kontschieder, Madalina Fiterau, Antonio Criminisi, Samuel Rota Bulò*
2. Deep Fried Convnets, *Zichao Yang, Marcin Moczulski, Misha Denil, Nando de Freitas, Alex Smola, Le Song, Ziyu Wang*
3. Semantic Component Analysis, *Calvin Murdock, Fernando De la Torre*
4. Low-Rank Matrix Factorization Under General Mixture Noise Distributions, *Xiangyong Cao, Yang Chen, Qian Zhao, Deyu Meng, Yao Wang, Dong Wang, Zongben Xu*
5. Web-Scale Image Clustering Revisited, *Yannis Avrithis, Yannis Kalantidis, Evangelos Anagnostopoulos, Ioannis Z. Emiris*
6. Learning Discriminative Reconstructions for Unsupervised Outlier Removal, *Yan Xia, Xudong Cao, Fang Wen, Gang Hua, Jian Sun*

1500–1730 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-2A.

Available at: http://goo.gl/xIksjI

1500–1730 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

1500–1730 Demos (Multi Purpose Area B)

- Live Demo for Semantic Image Segmentation, *Shuai Zheng, Sadeep Jayasumana, Bernardino Romera-Paredes (Univ. of Oxford)*
- Showcasing SegNet: A Deep Encoder-Decoder Architecture for Real-Time Road Scene Segmentation, *Vijay Badrinarayanan, Alex Kendall, Roberto Cipolla (Univ. of Cambridge)*

1445–1530 Break (Ventisquero Courtyard and Foyer)

1500–1730 Poster Session P-2A: Optimization, Segmentation, and Recognition (Multi Purpose Area B)

1. Learning Deconvolution Network for Semantic Segmentation, *Hyeonwoo Noh, Seunghoon Hong, Bohyung Han*
2. Conditional Random Fields as Recurrent Neural Networks, *Shuai Zheng, Sadeep Jayasumana, Bernardino Romera-Paredes, Vibhav Vineet, Zhizhong Su, Dalong Du, Chang Huang, Philip H. S. Torr*
3. The One Triangle Three Parallelograms Sampling Strategy and Its Application in Shape Regression, *Mikael Nilsson*
4. Boosting Object Proposals: From Pascal to COCO, *Jordi Pont-Tuset, Luc Van Gool*
5. Secrets of GrabCut and Kernel K-Means, *Meng Tang, Ismail Ben Ayed, Dmitrii Marin, Yuri Boykov*
6. Video Matting via Sparse and Low-Rank Representation, *Dongqing Zou, Xiaowu Chen, Guangying Cao, Xiaogang Wang*
7. Joint Object and Part Segmentation Using Deep Learned Potentials, *Peng Wang, Xiaohui Shen, Zhe Lin, Scott Cohen, Brian Price, Alan L. Yuille*
8. Low-Rank Tensor Constrained Multiview Subspace Clustering, *Changqing Zhang, Huazhu Fu, Si Liu, Guangcan Liu, Xiaochun Cao*
9. BodyPrint: Pose Invariant 3D Shape Matching of Human Bodies, *Jiangping Wang, Kai Ma, Vivek Kumar Singh, Thomas Huang, Terrence Chen*
10. The Middle Child Problem: Revisiting Parametric Min-Cut and Seeds for Object Proposals, *Ahmad Humayun, Fuxin Li, James M. Rehg*
11. Contour Guided Hierarchical Model for Shape Matching, *Yuanqi Su, Yuehu Liu, Bonan Cuan, Nanning Zheng*
12. Robust Image Segmentation Using Contour-Guided Color Palettes, *Xiang Fu, Chien-Yi Wang, Chen Chen, Changhu Wang, C.-C. Jay Kuo*
13. Joint Optimization of Segmentation and Color Clustering, *Ekaterina Lobacheva, Olga Veksler, Yuri Boykov*

14. BoxSup: Exploiting Bounding Boxes to Supervise Convolutional Networks for Semantic Segmentation, *Jifeng Dai, Kaiming He, Jian Sun*
15. Detection and Segmentation of 2D Curved Reflection Symmetric Structures, *Ching L. Teo, Cornelia Fermüller, Yiannis Aloimonos*
16. Unsupervised Tube Extraction Using Transductive Learning and Dense Trajectories, *Mihai Marian Puscas, Enver Sangineto, Dubravko Culibrk, Nicu Sebe*
17. Compositional Hierarchical Representation of Shape Manifolds for Classification of Non-Manifold Shapes, *Mete Ozay, Umit Rusen Aktas, Jeremy L. Wyatt, Aleš Leonardis*
18. Shell PCA: Statistical Shape Modelling in Shell Space, *Chao Zhang, Behrend Heeren, Martin Rumpf, William A. P. Smith*
19. Learning to Combine Mid-Level Cues for Object Proposal Generation, *Tom Lee, Sanja Fidler, Sven Dickinson*
20. Enhancing Road Maps by Parsing Aerial Images Around the World, *Gellért Máttyus, Shenlong Wang, Sanja Fidler, Raquel Urtasun*
21. Probabilistic Appearance Models for Segmentation and Classification, *Julia Krüger, Jan Ehrhardt, Heinz Handels*
22. A Randomized Ensemble Approach to Industrial CT Segmentation, *Hyojin Kim, Jayaraman Jayaraman J. Thiagarajan, Peer-Timo Bremer*
23. Semi-Supervised Normalized Cuts for Image Segmentation, *Selene E. Chew, Nathan D. Cahill*
24. StereoSnakes: Contour Based Consistent Object Extraction For Stereo Images, *Ran Ju, Tongwei Ren, Gangshan Wu*
25. Semantic Segmentation of RGBD Images With Mutex Constraints, *Zhuo Deng, Sinisa Todorovic, Longin Jan Latecki*
26. Weakly- and Semi-Supervised Learning of a Deep Convolutional Network for Semantic Image Segmentation, *George Papandreou, Liang-Chieh Chen, Kevin P. Murphy, Alan L. Yuille*
27. Efficient Decomposition of Image and Mesh Graphs by Lifted Multicuts, *Margret Keuper, Evgeny Levinkov, Nicolas Bonneel, Guillaume Lavoué, Thomas Brox, Björn Andres*
28. Parsimonious Labeling, *Puneet K. Dokania, M. Pawan Kumar*
29. Volumetric Bias in Segmentation and Reconstruction: Secrets and Solutions, *Yuri Boykov, Hossam Isack, Carl Olsson, Ismail Ben Ayed*
30. Entropy Minimization for Convex Relaxation Approaches, *Mohamed Souiai, Martin R. Oswald, Youngwook Kee, Junmo Kim, Marc Pollefeys, Daniel Cremers*
31. Adaptively Unified Semi-Supervised Dictionary Learning With Active Points, *Xiaobo Wang, Xiaojie Guo, Stan Z. Li*
32. Constrained Convolutional Neural Networks for Weakly Supervised Segmentation, *Deepak Pathak, Philipp Krähenbühl, Trevor Darrell*
33. A Multiscale Variable-Grouping Framework for MRF Energy Minimization, *Omer Meir, Meirav Galun, Stav Yagev, Ronen Basri, Irad Yavneh*
34. Inferring M-Best Diverse Labelings in a Single One, *Alexander Kirillov, Bogdan Savchynskyy, Dmitrij Schlesinger, Dmitry Vetrov, Carsten Rother*
35. Convolutional Sparse Coding for Image Super-Resolution, *Shuhang Gu, Wangmeng Zuo, Qi Xie, Deyu Meng, Xiangchu Feng, Lei Zhang*
36. A Wavefront Marching Method for Solving the Eikonal Equation on Cartesian Grids, *Brais Cancela, Marcos Ortega, Manuel G. Penedo*
37. A Projection Free Method for Generalized Eigenvalue Problem With a Nonsmooth Regularizer, *Seong Jae Hwang, Maxwell D. Collins, Sathya N. Ravi, Vamsi K. Ithapu, Nagesh Adluru, Sterling C. Johnson, Vikas Singh*
38. Optimizing Expected Intersection-Over-Union With Candidate-Constrained CRFs, *Faruk Ahmed, Dany Tarlow, Dhruv Batra*
39. Higher-Order Inference for Multi-Class Log-Supermodular Models, *Jian Zhang, Josip Djolonga, Andreas Krause*
40. Depth-Based Hand Pose Estimation: Data, Methods, and Challenges, *James S. Supančič III, Grégory Rogez, Yi Yang, Jamie Shotton, Deva Ramanan*
41. Adaptive Dither Voting for Robust Spatial Verification, *Xiaomeng Wu, Kunio Kashino*
42. Alternating Co-Quantization for Cross-Modal Hashing, *Go Irie, Hiroyuki Arai, Yukinobu Taniguchi*
43. Learning Deep Representation With Large-Scale Attributes, *Wanli Ouyang, Hongyang Li, Xingyu Zeng, Xiaogang Wang*
44. Deep Learning Strong Parts for Pedestrian Detection, *Yonglong Tian, Ping Luo, Xiaogang Wang, Xiaoou Tang*

45. Flowing ConvNets for Human Pose Estimation in Videos, *Tomas Pfister, James Charles, Andrew Zisserman*
46. Top Rank Supervised Binary Coding for Visual Search, *Dongjin Song, Wei Liu, Rongrong Ji, David A. Meyer, John R. Smith*
47. BubbLeNet: Foveated Imaging for Visual Discovery, *Kevin Matzen, Noah Snavely*
48. PQTable: Fast Exact Asymmetric Distance Neighbor Search for Product Quantization Using Hash Tables, *Yusuke Matsui, Toshihiko Yamasaki, Kiyoharu Aizawa*
49. Lending A Hand: Detecting Hands and Recognizing Activities in Complex Egocentric Interactions, *Sven Bambach, Stefan Lee, David J. Crandall, Chen Yu*
50. Fast and Accurate Head Pose Estimation via Random Projection Forests, *Donghoon Lee, Ming-Hsuan Yang, Songhwai Oh*
51. An MRF-Poselets Model for Detecting Highly Articulated Humans, *Duc Thanh Nguyen, Minh-Khoi Tran, Sai-Kit Yeung*
52. Beyond Tree Structure Models: A New Occlusion Aware Graphical Model for Human Pose Estimation, *Lianrui Fu, Junge Zhang, Kaiqi Huang*
53. Relaxing From Vocabulary: Robust Weakly-Supervised Deep Learning for Vocabulary-Free Image Tagging, *Jianlong Fu, Yue Wu, Tao Mei, Jinqiao Wang, Hanqing Lu, Yong Rui*
54. Visual Phrases for Exemplar Face Detection, *Vijay Kumar, Anoop Namboodiri, C. V. Jawahar*
55. Spatial Semantic Regularisation for Large Scale Object Detection, *Damian Mrowca, Marcus Rohrbach, Judy Hoffman, Ronghang Hu, Kate Saenko, Trevor Darrell*
56. Human Pose Estimation in Videos, *Dong Zhang, Mubarak Shah*
57. Contour Box: Rejecting Object Proposals Without Explicit Closed Contours, *Cewu Lu, Shu Liu, Jiaya Jia, Chi-Keung Tang*

1730–1845 ICCV 2015 Awards (Del Parque Grand Salon)

1845–2030 Reception (Park Level – Terraza)

Directions: In the park on the ground level of the convention center.

2030–2200 PAMI Technical Committee Meeting (Del Parque Grand Salon)

Tuesday, December 15

0730–1800 Registration (Austral Courtyard)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

0830–0945 Oral Session O-3A: Registration, Alignment and Stereo (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-3A.

Chairs: Yasutaka Furukawa *(Washington Univ.)*
Konrad Schindler *(ETH Zurich)*

Format (13 min. for presentation + 2 min. for questions)

1. Registering Images to Untextured Geometry Using Average Shading Gradients, *Tobias Plötz, Stefan Roth*
2. Robust Nonrigid Registration by Convex Optimization, *Qifeng Chen, Vladlen Koltun*
3. Robust and Optimal Sum-of-Squares-Based Point-to-Plane Registration of Image Sets and Structured Scenes, *Danda Pani Paudel, Adlane Habed, Cédric Demonceaux, Pascal Vasseur*
4. MeshStereo: A Global Stereo Model With Mesh Alignment Regularization for View Interpolation, *Chi Zhang, Zhiwei Li, Yanhua Cheng, Rui Cai, Hongyang Chao, Yong Rui*
5. CV-HAZOP: Introducing Test Data Validation for Computer Vision, *Oliver Zendel, Markus Murschitz, Martin Humenberger, Wolfgang Herzner*

0945–1215 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-3A.

Available at: http://goo.gl/ArAs8k

0945–1215 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

0945–1215 Demos (Multi Purpose Area B)

- MC3D: Motion Contrast 3D Scanning, *Nathan Matsuda (Northwestern Univ.)*
- Automatic Segmentation of Rectangular Patches in 3D Point Clouds, *William Nguatem (Bundeswehr Univ. Munich)*

0945–1030 Break (Ventisquero Courtyard and Foyer)

0945–1215 Poster Session P-3A: Recognition and 3D Computer Vision II (Multi Purpose Area B)

1. Structure From Motion Using Structure-Less Resection, *Enliang Zheng, Changchang Wu*
2. Joint Camera Clustering and Surface Segmentation for Large-Scale Multi-View Stereo, *Runze Zhang, Shiwei Li, Tian Fang, Siyu Zhu, Long Quan*
3. Higher-Order CRF Structural Segmentation of 3D Reconstructed Surfaces, *Jingbo Liu, Jinglu Wang, Tian Fang, Chiew-Lan Tai, Long Quan*
4. Hyperpoints and Fine Vocabularies for Large-Scale Location Recognition, *Torsten Sattler, Michal Havlena, Filip Radenović, Konrad Schindler, Marc Pollefeys*
5. Globally Optimal 2D-3D Registration From Points or Lines Without Correspondences, *Mark Brown, David Windridge, Jean-Yves Guillemaut*
6. The HCI Stereo Metrics: Geometry-Aware Performance Analysis of Stereo Algorithms, *Katrin Honauer, Lena Maier-Hein, Daniel Kondermann*
7. Merging the Unmatchable: Stitching Visually Disconnected SfM Models, *Andrea Cohen, Torsten Sattler, Marc Pollefeys*
8. 3D Fragment Reassembly Using Integrated Template Guidance and Fracture-Region Matching, *Kang Zhang, Wuyi Yu, Mary Manhein, Warren Waggenspack, Xin Li*
9. Procedural Editing of 3D Building Point Clouds, *İlke Demir, Daniel G. Aliaga, Bedrich Benes*
10. Semantically-Aware Aerial Reconstruction From Multi-Modal Data, *Randi Cabezas, Julian Straub, John W. Fisher III*
11. Guaranteed Outlier Removal for Rotation Search, *Álvaro Parra Bustos, Tat-Jun Chin*

12. Peeking Template Matching for Depth Extension, *Simon Korman, Eyal Ofek, Shai Avidan*
13. Deformable 3D Fusion: From Partial Dynamic 3D Observations to Complete 4D Models, *Weipeng Xu, Mathieu Salzmann, Yongtian Wang, Yue Liu*
14. Non-Parametric Structure-Based Calibration of Radially Symmetric Cameras, *Federico Camposeco, Torsten Sattler, Marc Pollefeys*
15. Exploiting Object Similarity in 3D Reconstruction, *Chen Zhou, Fatma Güney, Yizhou Wang, Andreas Geiger*
16. You Are Here: Mimicking the Human Thinking Process in Reading Floor-Plans, *Hang Chu, Dong Ki Kim, Tsuhan Chen*
17. MAP Disparity Estimation Using Hidden Markov Trees, *Eric T. Psota, Jędrzej Kowalczuk, Mateusz Mittek, Lance C. Pérez*
18. Wide Baseline Stereo Matching With Convex Bounded Distortion Constraints, *Meirav Galun, Tal Amir, Tal Hassner, Ronen Basri, Yaron Lipman*
19. Interactive Visual Hull Refinement for Specular and Transparent Object Surface Reconstruction, *Xinxin Zuo, Chao Du, Sen Wang, Jiangbin Zheng, Ruigang Yang*
20. Hierarchical Higher-Order Regression Forest Fields: An Application to 3D Indoor Scene Labelling, *Trung T. Pham, Ian Reid, Yasir Latif, Stephen Gould*
21. Classical Scaling Revisited, *Gil Shamai, Yonathan Aflalo, Michael Zibulevsky, Ron Kimmel*
22. Dense Continuous-Time Tracking and Mapping With Rolling Shutter RGB-D Cameras, *Christian Kerl, Jörg Stückler, Daniel Cremers*
23. Dense Image Registration and Deformable Surface Reconstruction in Presence of Occlusions and Minimal Texture, *Dat Tien Ngo, Sanghyuk Park, Anne Jorstad, Alberto Crivellaro, Chang D. Yoo, Pascal Fua*
24. The Likelihood-Ratio Test and Efficient Robust Estimation, *Andrea Cohen, Christopher Zach*
25. Reflection Modeling for Passive Stereo, *Rahul Nair, Andrew Fitzgibbon, Daniel Kondermann, Carsten Rother*
26. Detailed Full-Body Reconstructions of Moving People From Monocular RGB-D Sequences, *Federica Bogo, Michael J. Black, Matthew Loper, Javier Romero*
27. Efficient Solution to the Epipolar Geometry for Radially Distorted Cameras, *Zuzana Kukelova, Jan Heller, Martin Bujnak, Andrew Fitzgibbon, Tomas Pajdla*
28. Learning a Descriptor-Specific 3D Keypoint Detector, *Samuele Salti, Federico Tombari, Riccardo Spezialetti, Luigi Di Stefano*
29. Component-Wise Modeling of Articulated Objects, *Valsamis Ntouskos, Marta Sanzari, Bruno Cafaro, Federico Nardi, Fabrizio Natola, Fiora Pirri, Manuel Ruiz*
30. A Collaborative Filtering Approach to Real-Time Hand Pose Estimation, *Chiho Choi, Ayan Sinha, Joon Hee Choi, Sujin Jang, Karthik Ramani*
31. On the Equivalence of Moving Entrance Pupil and Radial Distortion for Camera Calibration, *Avinash Kumar, Narendra Ahuja*
32. A Linear Generalized Camera Calibration From Three Intersecting Reference Planes, *Mai Nishimura, Shohei Nobuhara, Takashi Matsuyama, Shinya Shimizu, Kensaku Fujii*
33. Towards Pointless Structure From Motion: 3D Reconstruction and Camera Parameters From General 3D Curves, *Irina Nurutdinova, Andrew Fitzgibbon*
34. Attributed Grammars for Joint Estimation of Human Attributes, Part and Pose, *Seyoung Park, Song-Chun Zhu*
35. Real-Time Pose Estimation Piggybacked on Object Detection, *Roman Juránek, Adam Herout, Markéta Dubská, Pavel Zemčík*
36. Understanding and Predicting Image Memorability at a Large Scale, *Aditya Khosla, Akhil S. Raju, Antonio Torralba, Aude Oliva*
37. Multiple Granularity Descriptors for Fine-Grained Categorization, *Dequan Wang, Zhiqiang Shen, Jie Shao, Wei Zhang, Xiangyang Xue, Zheng Zhang*
38. Guiding the Long-Short Term Memory Model for Image Caption Generation, *Xu Jia, Efstratios Gavves, Basura Fernando, Tinne Tuytelaars*
39. Just Noticeable Differences in Visual Attributes, *Aron Yu, Kristen Grauman*
40. VQA: Visual Question Answering, *Stanislaw Antol, Aishwarya Agrawal, Jiasen Lu, Margaret Mitchell, Dhruv Batra, C. Lawrence Zitnick, Devi Parikh*
41. Localize Me Anywhere, Anytime: A Multi-Task Point-Retrieval Approach, *Guoyu Lu, Yan Yan, Li Ren, Jingkuan Song, Nicu Sebe, Chandra Kambhamettu*
42. Dense Optical Flow Prediction From a Static Image, *Jacob Walker, Abhinav Gupta, Martial Hebert*

43. Unsupervised Domain Adaptation for Zero-Shot Learning, *Elyor Kodirov, Tao Xiang, Zhenyong Fu, Shaogang Gong*
44. Visual Madlibs: Fill in the Blank Description Generation and Question Answering, *Licheng Yu, Eunbyung Park, Alexander C. Berg, Tamara L. Berg*
45. Actions and Attributes From Wholes and Parts, *Georgia Gkioxari, Ross Girshick, Jitendra Malik*
46. DeepBox: Learning Objectness With Convolutional Networks, *Weicheng Kuo, Bharath Hariharan, Jitendra Malik*
47. Active Object Localization With Deep Reinforcement Learning, *Juan C. Caicedo, Svetlana Lazebnik*
48. Scene-Domain Active Part Models for Object Representation, *Zhou Ren, Chaohui Wang, Alan L. Yuille*
49. A Unified Multiplicative Framework for Attribute Learning, *Kongming Liang, Hong Chang, Shiguang Shan, Xilin Chen*
50. Contractive Rectifier Networks for Nonlinear Maximum Margin Classification, *Senjian An, Munawar Hayat, Salman H. Khan, Mohammed Bennamoun, Farid Boussaid, Ferdous Sohel*
51. Augmenting Strong Supervision Using Web Data for Fine-Grained Categorization, *Zhe Xu, Shaoli Huang, Ya Zhang, Dacheng Tao*
52. Learning Like a Child: Fast Novel Visual Concept Learning From Sentence Descriptions of Images, *Junhua Mao, Xu Wei, Yi Yang, Jiang Wang, Zhiheng Huang, Alan L. Yuille*
53. Learning Common Sense Through Visual Abstraction, *Ramakrishna Vedantam, Xiao Lin, Tanmay Batra, C. Lawrence Zitnick, Devi Parikh*
54. Domain Generalization for Object Recognition With Multi-Task Autoencoders, *Muhammad Ghifary, W. Bastiaan Kleijn, Mengjie Zhang, David Balduzzi*
55. Square Localization for Efficient and Accurate Object Detection, *Cewu Lu, Yongyi Lu, Hao Chen, Chi-Keung Tang*
56. Box Aggregation for Proposal Decimation: Last Mile of Object Detection, *Shu Liu, Cewu Lu, Jiaya Jia*
57. DeepProposal: Hunting Objects by Cascading Deep Convolutional Layers, *Amir Ghodrati, Ali Diba, Marco Pedersoli, Tinne Tuytelaars, Luc Van Gool*
58. Semantic Segmentation With Object Clique Potential, *Xiaojuan Qi, Jianping Shi, Shu Liu, Renjie Liao, Jiaya Jia*
59. Automatic Concept Discovery From Parallel Text and Visual Corpora, *Chen Sun, Chuang Gan, Ram Nevatia*
60. Simpler Non-Parametric Methods Provide as Good or Better Results to Multiple-Instance Learning, *Ragav Venkatesan, Parag Chandakkar, Baoxin Li*
61. Monocular Object Instance Segmentation and Depth Ordering With CNNs, *Ziyu Zhang, Alexander G. Schwing, Sanja Fidler, Raquel Urtasun*
62. Multimodal Convolutional Neural Networks for Matching Image and Sentence, *Lin Ma, Zhengdong Lu, Lifeng Shang, Hang Li*
63. Structural Kernel Learning for Large Scale Multiclass Object Co-Detection, *Zeeshan Hayder, Xuming He, Mathieu Salzmann*
64. Flickr30k Entities: Collecting Region-to-Phrase Correspondences for Richer Image-to-Sentence Models, *Bryan A. Plummer, Liwei Wang, Chris M. Cervantes, Juan C. Caicedo, Julia Hockenmaier, Svetlana Lazebnik*
65. Predicting Depth, Surface Normals and Semantic Labels With a Common Multi-Scale Convolutional Architecture, *David Eigen, Rob Fergus*
66. AttentionNet: Aggregating Weak Directions for Accurate Object Detection, *Donggeun Yoo, Sunggyun Park, Joon-Young Lee, Anthony S. Paek, In So Kweon*
67. Common Subspace for Model and Similarity: Phrase Learning for Caption Generation From Images, *Yoshitaka Ushiku, Masataka Yamaguchi, Yusuke Mukuta, Tatsuya Harada*

1215–1315 Oral Session O-3B: 3D Representations for Recognition & Localization
(Del Parque Grand Salon)

Papers 1, 3, & 4 are in P-3A; paper 2 is in P-3B.

Chairs: Abhinav Gupta *(Carnegie Mellon Univ.)*
Ian Reid *(Univ. of Adelaide)*

Format (13 min. for presentation + 2 min. for questions)

1. 3D-Assisted Feature Synthesis for Novel Views of an Object, *Hao Su, Fan Wang, Eric Yi, Leonidas J. Guibas*
2. Render for CNN: Viewpoint Estimation in Images Using CNNs Trained With Rendered 3D Model Views, *Hao Su, Charles R. Qi, Yangyan Li, Leonidas J. Guibas*

3. Lost Shopping! Monocular Localization in Large Indoor Spaces, *Shenlong Wang, Sanja Fidler, Raquel Urtasun*
4. Camera Pose Voting for Large-Scale Image-Based Localization, *Bernhard Zeisl, Torsten Sattler, Marc Pollefeys*

1315–1445 Lunch (On your own)

1315–1445 Doctoral Consortium (Los Araucarias Hall, El Canelo Hall, and El Colgue Hall) (by invitation only)

Supported by: Baidu 百度

- Umit Aktas *(Univ. of Birmingham)*
- Artem Babenko *(Moscow Inst. of Physics and Technology)*
- Vasileios Belagiannis *(Univ. of Oxford)*
- Fernando Bernuy *(AMTC Universidad de Chile)*
- Fatih Cakir *(Boston Univ.)*
- Chenyi Chen *(Princeton Univ.)*
- Hsin-I Chen *(National Taiwan Univ.)*
- Wen-Sheng Chu *(Carnegie Mellon Univ.)*
- Zhaopeng Cui *(Simon Fraser Univ.)*
- Fillipe de Souza *(Univ. of South Florida)*
- Ilke Demir *(Purdue Univ.)*
- Puneet Dokania *(CentraleSupelec and INRIA)*
- Michele Fenzi *(Leibniz Universität Hannover)*
- Madalina Fiterau *(Carnegie Mellon Univ.)*
- David Fouhey *(Carnegie Mellon Univ.)*
- Ying Fu *(The Univ. of Tokyo)*
- Danna Gurari *(Univ. of Texas at Austin)*
- Hossein Hajimirsadeghi *(Simon Fraser Univ.)*
- Mahmudul Hasan *(Univ. of California, Riverside)*
- João Henriques *(Univ. of Coimbra)*
- Jiaji Huang *(Duke Univ.)*
- Junshi Huang *(National Univ. of Singapore)*
- Mariano Jaimez *(Technische Universität München)*
- Ashesh Jain *(Cornell Univ.)*
- Pan Ji *(Australian National Univ.)*
- Karel Lebeda *(Univ. of Surrey)*
- Stefan Lee *(Indiana Univ.)*
- Tom Lee *(Univ. of Toronto)*
- Sijin Li *(City Univ. of Hong Kong)*
- Wei Liu *(Univ. of North Carolina at Chapel Hill)*
- Guoyu Lu *(Univ. of Delaware)*
- Nikhil Naik *(MIT Media Lab)*
- Alvaro Parra Bustos *(The Univ. of Adelaide)*
- Genevieve Patterson *(Brown Univ.)*
- Danda Pani Paudel *(CNRS)*
- Helge Rhodin *(Max-Planck-Institut für Informatik)*
- Christos Sagonas *(Imperial College London)*
- Ayan Sinha *(Purdue Univ.)*
- Patrick Snape *(Imperial College London)*
- Khurram Soomro *(Univ. of Central Florida)*
- Bilge Soran *(Univ. of Washington)*
- Jan Stühmer *(Technische Universität München)*
- Chen Sun *(Univ. of Southern Calif.)*
- Chris Sweeney *(Univ. of California, Santa Barbara)*
- Manolis Tsakiris *(Johns Hopkins Univ.)*
- Jack Valmadre *(Queensland Univ. of Technology)*
- Raviteja Vemulapalli *(Univ. of Maryland, College Park)*
- Yu Xiang *(Univ. of Michigan at Ann Arbor)*
- Zhicheng Yan *(Univ. of Illinois at Urbana-Champaign)*
- Junchi Yan *(Shanghai Jiao Tong Univ.)*
- Shuai Yi *(The Chinese Univ. of Hong Kong)*
- Chen-Ping Yu *(Stony Brook Univ.)*
- Rui Yu *(Univ. College London)*
- Bernhard Zeisl *(ETH Zürich)*
- Dong Zhang *(Univ. of Central Florida)*
- Zhanpeng Zhang *(The Chinese Univ. of Hong Kong)*
- Yibiao Zhao *(Univ. of California, Los Angeles)*
- Qian Zhao *(Xi'an Jiaotong Univ.)*
- Liang Zheng *(Univ. of Texas at San Antonio)*

1445–1715 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-3B.

Available at: http://goo.gl/Wz4usX

1445–1715 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

1445–1715 Demos (Multi Purpose Area B)

- FlowNet: Real-Time Optical Flow Estimation with Convolutional Networks, *Alexey Dosovitskiy, Philipp Fischer, Eddy Ilg, Philip Häusser, Daniel Cremers, Thomas Brox (Univ. of Freiburg; Technical Univ. of Munich)*
- ALIEN 2.0: The Infinite Memory, *Federico Pernici, Alberto Del Bimbo (Univ. of Florence)*

1445–1530 Break (Ventisquero Courtyard and Foyer)

1445–1715 Poster Session P-3B: Statistical Methods & Learning, Motion & Tracking, and Video Analysis I (Multi Purpose Area B)

1. MANTRA: Minimum Maximum Latent Structural SVM for Image Classification and Ranking, *Thibaut Durand, Nicolas Thome, Matthieu Cord*
2. DeepDriving: Learning Affordance for Direct Perception in Autonomous Driving, *Chenyi Chen, Ari Seff, Alain Kornhauser, Jianxiong Xiao*
3. Active Transfer Learning With Zero-Shot Priors: Reusing Past Datasets for Future Tasks, *Efstratios Gavves, Thomas Mensink, Tatiana Tommasi, Cees G. M. Snoek, Tinne Tuytelaars*
4. HD-CNN: Hierarchical Deep Convolutional Neural Networks for Large Scale Visual Recognition, *Zhicheng Yan, Hao Zhang, Robinson Piramuthu, Vignesh Jagadeesh, Dennis DeCoste, Wei Di, Yizhou Yu*
5. Learning The Structure of Deep Convolutional Networks, *Jiashi Feng, Trevor Darrell*
6. FlowNet: Learning Optical Flow With Convolutional Networks, *Alexey Dosovitskiy, Philipp Fischer, Eddy Ilg, Philip Häusser, Caner Hazırbaş, Vladimir Golkov, Patrick van der Smagt, Daniel Cremers, Thomas Brox*
7. Learning Semi-Supervised Representation Towards a Unified Optimization Framework for Semi-Supervised Learning, *Chun-Guang Li, Zhouchen Lin, Honggang Zhang, Jun Guo*
8. Context-Guided Diffusion for Label Propagation on Graphs, *Kwang In Kim, James Tompkin, Hanspeter Pfister, Christian Theobalt*
9. Learning to Rank Based on Subsequences, *Basura Fernando, Efstratios Gavves, Damien Muselet, Tinne Tuytelaars*
10. Unsupervised Learning of Visual Representations Using Videos, *Xiaolong Wang, Abhinav Gupta*
11. A Nonparametric Bayesian Approach Toward Stacked Convolutional Independent Component Analysis, *Sotirios P. Chatzis, Dimitrios Kosmopoulos*
12. Robust Principal Component Analysis on Graphs, *Nauman Shahid, Vassilis Kalofolias, Xavier Bresson, Michael Bronstein, Pierre Vandergheynst*
13. Projection Bank: From High-Dimensional Data to Medium-Length Binary Codes, *Li Liu, Mengyang Yu, Ling Shao*
14. Robust Optimization for Deep Regression, *Vasileios Belagiannis, Christian Rupprecht, Gustavo Carneiro, Nassir Navab*
15. Multi-Class Multi-Annotator Active Learning With Robust Gaussian Process for Visual Recognition, *Chengjiang Long, Gang Hua*
16. Maximum-Margin Structured Learning With Deep Networks for 3D Human Pose Estimation, *Sijin Li, Weichen Zhang, Antoni B. Chan*
17. An Exploration of Parameter Redundancy in Deep Networks With Circulant Projections, *Yu Cheng, Felix X. Yu, Rogerio S. Feris, Sanjiv Kumar, Alok Choudhary, Shi-Fu Chang*
18. Additive Nearest Neighbor Feature Maps, *Zhenzhen Wang, Xiao-Tong Yuan, Qingshan Liu, Shuicheng Yan*
19. Understanding Deep Features With Computer-Generated Imagery, *Mathieu Aubry, Bryan C. Russell*

20. Interpolation on the Manifold of *K* Component GMMs, *Hyunwoo J. Kim, Nagesh Adluru, Monami Banerjee, Baba C. Vemuri, Vikas Singh*
21. Context-Aware CNNs for Person Head Detection, *Tuan-Hung Vu, Anton Osokin, Ivan Laptev*
22. Mode-Seeking on Hypergraphs for Robust Geometric Model Fitting, *Hanzi Wang, Guobao Xiao, Yan Yan, David Suter*
23. Highly-Expressive Spaces of Well-Behaved Transformations: Keeping It Simple, *Oren Freifeld, Søren Hauberg, Kayhan Batmanghelich, John W. Fisher III*
24. Entropy-Based Latent Structured Output Prediction, *Diane Bouchacourt, Sebastian Nowozin, M. Pawan Kumar*
25. Fast Orthogonal Projection Based on Kronecker Product, *Xu Zhang, Felix X. Yu, Ruiqi Guo, Sanjiv Kumar, Shengjin Wang, Shi-Fu Chang*
26. PoseNet: A Convolutional Network for Real-Time 6-DOF Camera Relocalization, *Alex Kendall, Matthew Grimes, Roberto Cipolla*
27. Predicting Multiple Structured Visual Interpretations, *Debadeepta Dey, Varun Ramakrishna, Martial Hebert, J. Andrew Bagnell*
28. Look and Think Twice: Capturing Top-Down Visual Attention With Feedback Convolutional Neural Networks, *Chunshui Cao, Xianming Liu, Yi Yang, Yinan Yu, Jiang Wang, Zilei Wang, Yongzhen Huang, Liang Wang, Chang Huang, Wei Xu, Deva Ramanan, Thomas S. Huang*
29. Matrix Backpropagation for Deep Networks With Structured Layers, *Catalin Ionescu, Orestis Vantzos, Cristian Sminchisescu*
30. Introducing Geometry in Active Learning for Image Segmentation, *Ksenia Konyushkova, Raphael Sznitman, Pascal Fua*
31. Joint Fine-Tuning in Deep Neural Networks for Facial Expression Recognition, *Heechul Jung, Sihaeng Lee, Junho Yim, Sunjeong Park, Junmo Kim*
32. Direct Intrinsics: Learning Albedo-Shading Decomposition by Convolutional Regression, *Takuya Narihira, Michael Maire, Stella X. Yu*
33. Face Flow, *Patrick Snape, Anastasios Roussos, Yannis Panagakis, Stefanos Zafeiriou*
34. Discriminative Low-Rank Tracking, *Yao Sui, Yafei Tang, Li Zhang*
35. SOWP: Spatially Ordered and Weighted Patch Descriptor for Visual Tracking, *Han-Ul Kim, Dae-Youn Lee, Jae-Young Sim, Chang-Su Kim*
36. Live Repetition Counting, *Ofir Levy, Lior Wolf*
37. Near-Online Multi-Target Tracking With Aggregated Local Flow Descriptor, *Wongun Choi*
38. Multi-Kernel Correlation Filter for Visual Tracking, *Ming Tang, Jiayi Feng*
39. Joint Probabilistic Data Association Revisited, *Seyed Hamid Rezatofighi, Anton Milan, Zhen Zhang, Qinfeng Shi, Anthony Dick, Ian Reid*
40. Tracking-by-Segmentation With Online Gradient Boosting Decision Tree, *Jeany Son, Ilchae Jung, Kayoung Park, Bohyung Han*
41. Exploring Causal Relationships in Visual Object Tracking, *Karel Lebeda, Simon Hadfield, Richard Bowden*
42. Hierarchical Convolutional Features for Visual Tracking, *Chao Ma, Jia-Bin Huang, Xiaokang Yang, Ming-Hsuan Yang*
43. Robust Non-Rigid Motion Tracking and Surface Reconstruction Using L_0 Regularization, *Kaiwen Guo, Feng Xu, Yangang Wang, Yebin Liu, Qionghai Dai*
44. Online Object Tracking With Proposal Selection, *Yang Hua, Karteek Alahari, Cordelia Schmid*
45. Understanding and Diagnosing Visual Tracking Systems, *Naiyan Wang, Jianping Shi, Dit-Yan Yeung, Jiaya Jia*
46. Integrating Dashcam Views Through Inter-Video Mapping, *Hsin-I Chen, Yi-Ling Chen, Wei-Tse Lee, Fan Wang, Bing-Yu Chen*
47. Visual Tracking With Fully Convolutional Networks, *Lijun Wang, Wanli Ouyang, Xiaogang Wang, Huchuan Lu*
48. Multiple Feature Fusion via Weighted Entropy for Visual Tracking, *Lin Ma, Jiwen Lu, Jianjiang Feng, Jie Zhou*
49. Pedestrian Travel Time Estimation in Crowded Scenes, *Shuai Yi, Hongsheng Li, Xiaogang Wang*
50. Unsupervised Synchrony Discovery in Human Interaction, *Wen-Sheng Chu, Jiabei Zeng, Fernando De la Torre, Jeffrey F. Cohn, Daniel S. Messinger*
51. Efficient Video Segmentation Using Parametric Graph Partitioning, *Chen-Ping Yu, Hieu Le, Gregory Zelinsky, Dimitris Samaras*

52. Learning to Track for Spatio-Temporal Action Localization, *Philippe Weinzaepfel, Zaid Harchaoui, Cordelia Schmid*
53. Unsupervised Object Discovery and Tracking in Video Collections, *Suha Kwak, Minsu Cho, Ivan Laptev, Jean Ponce, Cordelia Schmid*
54. Car That Knows Before You Do: Anticipating Maneuvers via Learning Temporal Driving Models, *Ashesh Jain, Hema S. Koppula, Bharad Raghavan, Shane Soh, Ashutosh Saxena*
55. Activity Auto-Completion: Predicting Human Activities From Partial Videos, *Zhen Xu, Laiyun Qing, Jun Miao*
56. Person Re-Identification With Correspondence Structure Learning, *Yang Shen, Weiyao Lin, Junchi Yan, Mingliang Xu, Jianxin Wu, Jingdong Wang*
57. Adaptive Exponential Smoothing for Online Filtering of Pixel Prediction Maps, *Kang Dang, Jiong Yang, Junsong Yuan*
58. P-CNN: Pose-Based CNN Features for Action Recognition, *Guilhem Chéron, Ivan Laptev, Cordelia Schmid*
59. Fully Connected Object Proposals for Video Segmentation, *Federico Perazzi, Oliver Wang, Markus Gross, Alexander Sorkine-Hornung*
60. Video Segmentation With Just a Few Strokes, *Naveen Shankar Nagaraja, Frank R. Schmidt, Thomas Brox*
61. Actionness-Assisted Recognition of Actions, *Ye Luo, Loong-Fah Cheong, An Tran*
62. COUNT Forest: CO-Voting Uncertain Number of Targets Using Random Forest for Crowd Density Estimation, *Viet-Quoc Pham, Tatsuo Kozakaya, Osamu Yamaguchi, Ryuzo Okada*
63. Multi-Cue Structure Preserving MRF for Unconstrained Video Segmentation, *Saehoon Yi, Vladimir Pavlovic*
64. Motion Trajectory Segmentation via Minimum Cost Multicuts, *Margret Keuper, Bjoern Andres, Thomas Brox*
65. Action Localization in Videos Through Context Walk, *Khurram Soomro, Haroon Idrees, Mubarak Shah*
66. RGB-W: When Vision Meets Wireless, *Alexandre Alahi, Albert Haque, Li Fei-Fei*
67. Action Detection by Implicit Intentional Motion Clustering, *Wei Chen, Jason J. Corso*
68. Simultaneous Foreground Detection and Classification With Hybrid Features, *Jaemyun Kim, Adín Ramírez Rivera, Byungyong Ryu, Oksam Chae*

1400–1530 Oral Session O-3C: Vision & People
(Del Parque Grand Salon)

Papers in this session are also in Poster Session P-3B.

Chairs: Leonid Sigal *(Disney Research)*
Jürgen Gall *(Univ. of Bonn)*

Format (13 min. for presentation + 2 min. for questions)

1. Training a Feedback Loop for Hand Pose Estimation, *Markus Oberweger, Paul Wohlhart, Vincent Lepetit*
2. Opening the Black Box: Hierarchical Sampling Optimization for Estimating Human Hand Pose, *Danhang Tang, Jonathan Taylor, Pushmeet Kohli, Cem Keskin, Tae-Kyun Kim, Jamie Shotton*
3. Panoptic Studio: A Massively Multiview System for Social Motion Capture, *Hanbyul Joo, Hao Liu, Lei Tan, Lin Gui, Bart Nabbe, Iain Matthews, Takeo Kanade, Shohei Nobuhara, Yaser Sheikh*
4. Where to Buy It: Matching Street Clothing Photos in Online Shops, *M. Hadi Kiapour, Xufeng Han, Svetlana Lazebnik, Alexander C. Berg, Tamara L. Berg*
5. Multi-Task Recurrent Neural Network for Immediacy Prediction, *Xiao Chu, Wanli Ouyang, Wei Yang, Xiaogang Wang*
6. Learning Complexity-Aware Cascades for Deep Pedestrian Detection, *Zhaowei Cai, Mohammad Saberian, Nuno Vasconcelos*

Wednesday, December 16

0730–1800 Registration (Austral Courtyard)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

0830–0945 Oral Session O-4A: Computational Photography & Image Enhancement (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-4A.

Chairs: William T. Freeman *(MIT)*
Michael S. Brown *(National Univ. of Singapore)*

Format (13 min. for presentation + 2 min. for questions)

1. Polarized 3D: High-Quality Depth Sensing With Polarization Cues, *Achuta Kadambi, Vage Taamazyan, Boxin Shi, Ramesh Raskar*
2. Airborne Three-Dimensional Cloud Tomography, *Aviad Levis, Yoav Y. Schechner, Amit Aides, Anthony B. Davis*
3. Leave-One-Out Kernel Optimization for Shadow Detection, *Tomas F. Yago Vicente, Minh Hoai, Dimitris Samaras*
4. Removing Rain From a Single Image via Discriminative Sparse Coding, *Yu Luo, Yong Xu, Hui Ji*
5. Mutual-Structure for Joint Filtering, *Xiaoyong Shen, Chao Zhou, Li Xu, Jiaya Jia*

0945–1215 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-4A.

Available at: http://goo.gl/0N7NI8

0945–1215 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

0945–1215 Demos (Multi Purpose Area B)

- Anisotropic Reflectance Rendering of Noh-Kimono Costumes in Dynamic Lighting Environments With Bonfire, *Shiro Tanaka, Wataru Wakita, Hiromi T. Tanaka (Ritsumeikan Univ.; Hiroshima City Univ.)*
- The Menpo Project, *Patrick Snape, Epameinondas Antonakos (Imperial College London)*

0945–1030 Break (Ventisquero Courtyard and Foyer)

0945–1215 Poster Session P-4A: Computational Photography, Face & Gesture, and Vision for X (Multi Purpose Area B)

1. Photometric Stereo in a Scattering Medium, *Zak Murez, Tali Treibitz, Ravi Ramamoorthi, David Kriegman*
2. Resolving Scale Ambiguity Via XSlit Aspect Ratio Analysis, *Wei Yang, Haiting Lin, Sing Bing Kang, Jingyi Yu*
3. Single-Shot Specular Surface Reconstruction With Gonio-Plenoptic Imaging, *Lingfei Meng, Liyang Lu, Noah Bedard, Kathrin Berkner*
4. TransCut: Transparent Object Segmentation From a Light-Field Image, *Yichao Xu, Hajime Nagahara, Atsushi Shimada, Rin-ichiro Taniguchi*
5. Depth Recovery From Light Field Using Focal Stack Symmetry, *Haiting Lin, Can Chen, Sing Bing Kang, Jingyi Yu*
6. Depth Map Estimation and Colorization of Anaglyph Images Using Local Color Prior and Reverse Intensity Distribution, *Williem, Ramesh Raskar, In Kyu Park*
7. Learning Data-Driven Reflectance Priors for Intrinsic Image Decomposition, *Tinghui Zhou, Philipp Krähenbühl, Alexei A. Efros*
8. Photometric Stereo With Small Angular Variations, *Jian Wang, Yasuyuki Matsushita, Boxin Shi, Aswin C. Sankaranarayanan*
9. Occlusion-Aware Depth Estimation Using Light-Field Cameras, *Ting-Chun Wang, Alexei A. Efros, Ravi Ramamoorthi*
10. Oriented Light-Field Windows for Scene Flow, *Pratul P. Srinivasan, Michael W. Tao, Ren Ng, Ravi Ramamoorthi*

11. Extended Depth of Field Catadioptric Imaging Using Focal Sweep, *Ryunosuke Yokoya, Shree K. Nayar*
12. Intrinsic Depth: Improving Depth Transfer With Intrinsic Images, *Naejin Kong, Michael J. Black*
13. Separating Fluorescent and Reflective Components by Using a Single Hyperspectral Image, *Yinqiang Zheng, Ying Fu, Antony Lam, Imari Sato, Yoichi Sato*
14. Frequency-Based Environment Matting by Compressive Sensing, *Yiming Qian, Minglun Gong, Yee-Hong Yang*
15. Complementary Sets of Shutter Sequences for Motion Deblurring, *Hae-Gon Jeon, Joon-Young Lee, Yudeog Han, Seon Joo Kim, In So Kweon*
16. Hyperspectral Compressive Sensing Using Manifold-Structured Sparsity Prior, *Lei Zhang, Wei Wei, Yanning Zhang, Fei Li, Chunhua Shen, Qinfeng Shi*
17. A Gaussian Process Latent Variable Model for BRDF Inference, *Stamatios Georgoulis, Vincent Vanweddingen, Marc Proesmans, Luc Van Gool*
18. Active One-Shot Scan for Wide Depth Range Using a Light Field Projector Based on Coded Aperture, *Hiroshi Kawasaki, Satoshi Ono, Yuki Horita, Yuki Shiba, Ryo Furukawa, Shinsaku Hiura*
19. Model-Based Tracking at 300Hz Using Raw Time-of-Flight Observations, *Jan Stühmer, Sebastian Nowozin, Andrew Fitzgibbon, Richard Szeliski, Travis Perry, Sunil Acharya, Daniel Cremers, Jamie Shotton*
20. Hyperspectral Super-Resolution by Coupled Spectral Unmixing, *Charis Lanaras, Emmanuel Baltsavias, Konrad Schindler*
21. Depth Selective Camera: A Direct, On-Chip, Programmable Technique for Depth Selectivity in Photography, *Ryuichi Tadano, Adithya Kumar Pediredla, Ashok Veeraraghavan*
22. A Groupwise Multilinear Correspondence Optimization for 3D Faces, *Timo Bolkart, Stefanie Wuhrer*
23. Selective Encoding for Recognizing Unreliably Localized Faces, *Ang Li, Vlad Morariu, Larry S. Davis*
24. Confidence Preserving Machine for Facial Action Unit Detection, *Jiabei Zeng, Wen-Sheng Chu, Fernando De la Torre, Jeffrey F. Cohn, Zhang Xiong*
25. Learning Social Relation Traits From Face Images, *Zhanpeng Zhang, Ping Luo, Chen-Change Loy, Xiaoou Tang*
26. Robust Heart Rate Measurement From Video Using Select Random Patches, *Antony Lam, Yoshinori Kuno*
27. Robust Model-Based 3D Head Pose Estimation, *Gregory P. Meyer, Shalini Gupta, Iuri Frosio, Dikpal Reddy, Jan Kautz*
28. Robust Facial Landmark Detection Under Significant Head Poses and Occlusion, *Yue Wu, Qiang Ji*
29. Conditional Convolutional Neural Network for Modality-Aware Face Recognition, *Chao Xiong, Xiaowei Zhao, Danhang Tang, Karlekar Jayashree, Shuicheng Yan, Tae-Kyun Kim*
30. From Facial Parts Responses to Face Detection: A Deep Learning Approach, *Shuo Yang, Ping Luo, Chen-Change Loy, Xiaoou Tang*
31. Efficient PSD Constrained Asymmetric Metric Learning for Person Re-Identification, *Shengcai Liao, Stan Z. Li*
32. Pose-Invariant 3D Face Alignment, *Amin Jourabloo, Xiaoming Liu*
33. From Emotions to Action Units With Hidden and Semi-Hidden-Task Learning, *Adrià Ruiz, Joost Van de Weijer, Xavier Binefa*
34. Automated Facial Trait Judgment and Election Outcome Prediction: Social Dimensions of Face, *Jungseock Joo, Francis F. Steen, Song-Chun Zhu*
35. Simultaneous Local Binary Feature Learning and Encoding for Face Recognition, *Jiwen Lu, Venice Erin Liong, Jie Zhou*
36. Deep Learning Face Attributes in the Wild, *Ziwei Liu, Ping Luo, Xiaogang Wang, Xiaoou Tang*
37. Multi-Task Learning With Low Rank Attribute Embedding for Person Re-Identification, *Chi Su, Fan Yang, Shiliang Zhang, Qi Tian, Larry S. Davis, Wen Gao*
38. Regressing a 3D Face Shape From a Single Image, *Sergey Tulyakov, Nicu Sebe*
39. Rendering of Eyes for Eye-Shape Registration and Gaze Estimation, *Erroll Wood, Tadas Baltrušaitis, Xucong Zhang, Yusuke Sugano, Peter Robinson, Andreas Bulling*
40. Multi-Scale Learning for Low-Resolution Person Re-Identification, *Xiang Li, Wei-Shi Zheng, Xiaojuan Wang, Tao Xiang, Shaogang Gong*
41. Learning to Transfer: Transferring Latent Task Structures and Its Application to Person-Specific Facial Action Unit Detection, *Timur Almaev, Brais Martinez, Michel Valstar*

42. Pairwise Conditional Random Forests for Facial Expression Recognition, *Arnaud Dapogny, Kevin Bailly, Séverine Dubuisson*
43. Multi-Conditional Latent Variable Model for Joint Facial Action Unit Detection, *Stefanos Eleftheriadis, Ognjen Rudovic, Maja Pantic*
44. Leveraging Datasets With Varying Annotations for Face Alignment via Deep Regression Network, *Jie Zhang, Meina Kan, Shiguang Shan, Xilin Chen*
45. A Spatio-Temporal Appearance Representation for Viceo-Based Pedestrian Re-Identification, *Kan Liu, Bingpeng Ma, Wei Zhang, Rui Huang*
46. Two Birds, One Stone: Jointly Learning Binary Code for Large-Scale Face Image Retrieval and Attributes Prediction, *Yan Li, Ruiping Wang, Haomiao Liu, Huajie Jiang, Shiguang Shan, Xilin Chen*
47. An Accurate Iris Segmentation Framework Under Relaxed Imaging Constraints Using Total Variation Model, *Zijing Zhao, Kumar Ajay*
48. Discriminative Pose-Free Descriptors for Face and Object Matching, *Soubhik Sanyal, Sivaram Prasad Mudunuri, Soma Biswas*
49. Bi-Shifting Auto-Encoder for Unsupervised Domain Adaptation, *Meina Kan, Shiguang Shan, Xilin Chen*
50. Regressive Tree Structured Model for Facial Landmark Localization, *Gee-Sern Hsu, Kai-Hsiang Chang, Shih-Chieh Huang*
51. Person Recognition in Personal Photo Collections, *Seong Joon Oh, Rodrigo Benenson, Mario Fritz, Bernt Schiele*
52. Robust Statistical Face Frontalization, *Christos Sagonas, Yannis Panagakis, Stefanos Zafeiriou, Maja Pantic*
53. PIEFA: Personalized Incremental and Ensemble Face Alignment, *Xi Peng, Shaoting Zhang, Yu Yang, Dimitris N. Metaxas*
54. Understanding Everyday Hands in Action From RGB-D Images, *Grégory Rogez, James S. Supančič III, Deva Ramanan*
55. Example-Based Modeling of Facial Texture From Deficient Data, *Arnaud Dessein, William A. P. Smith, Richard C. Wilson, Edwin R. Hancock*
56. Learning to Predict Saliency on Face Images, *Mai Xu, Yun Ren, Zulin Wang*
57. Group Membership Prediction, *Ziming Zhang, Yuting Chen, Venkatesh Saligrama*
58. Extraction of Virtual Baselines From Distorted Document Images Using Curvilinear Projection, *Gaofeng Meng, Zuming Huang, Yonghong Song, Shiming Xiang, Chunhong Pan*
59. Robust RGB-D Odometry Using Point and Line Features, *Yan Lu, Dezhen Song*
60. Learning a Discriminative Model for the Perception of Realism in Composite Images, *Jun-Yan Zhu, Philipp Krähenbühl, Eli Shechtman, Alexei A. Efros*
61. What Makes Tom Hanks Look Like Tom Hanks, *Supasorn Suwajanakorn, Steven M. Seitz, Ira Kemelmacher-Shlizerman*
62. Wide-Area Image Geolocalization With Aerial Reference Imagery, *Scott Workman, Richard Souvenir, Nathan Jacobs*
63. Personalized Age Progression With Aging Dictionary, *Xiangbo Shu, Jinhui Tang, Hanjiang Lai, Luoqi Liu, Shuicheng Yan*
64. FaceDirector: Continuous Control of Facial Performance in Video, *Charles Malleson, Jean-Charles Bazin, Oliver Wang, Derek Bradley, Thabo Beeler, Adrian Hilton, Alexander Sorkine-Hornung*
65. Synthesizing Illumination Mosaics From Internet Photo-Collections, *Dinghuang Ji, Enrique Dunn, Jan-Michael Frahm*
66. Hot or Not: Exploring Correlations Between Appearance and Temperature, *Daniel Glasner, Pascal Fua, Todd Zickler, Lihi Zelnik-Manor*

1215–1315 Oral Session O-4B: Motion & Correspondence (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-4A.

Chairs: Thomas Brox *(Univ. of Freiburg)*
Ce Liu *(Google)*

Format (13 min. for presentation + 2 min. for questions)

1. SPM-BP: Sped-up PatchMatch Belief Propagation for Continuous MRFs, *Yu Li, Dongbo Min, Michael S. Brown, Minh N. Do, Jiangbo Lu*

2. Flow Fields: Dense Correspondence Fields for Highly Accurate Large Displacement Optical Flow Estimation, *Christian Bailer, Bertram Taetz, Didier Stricker*
3. Dense Semantic Correspondence Where Every Pixel is a Classifier, *Hilton Bristow, Jack Valmadre, Simon Lucey*
4. Multi-Image Matching via Fast Alternating Minimization, *Xiaowei Zhou, Menglong Zhu, Kostas Daniilidis*

1315–1445 Lunch (On your own)

1445–1715 Video Spotlights (Del Parque Grand Salon)

Video spotlights for Poster Session P-4B.

Available at: http://goo.gl/w1AYT5

1445–1715 Exhibits (Multi Purpose Area B)

- Same as Sunday morning Exhibits (see pg. 18)

1445–1715 Demos (Multi Purpose Area B)

- Expresso: A User-Friendly GUI for Designing, Training and Exploring Convolutional Neural Networks, *Santosh Ravi Kiran Sarvadevabhatla, R. Venkatesh Babu (Indian Institute of Science)*
- Interactive Action Recognition Based on Motion Capture Data, *Fabrizio Natola, Valsamis Ntouskos, Fiora Pirri, Marta Sanzari (Univ. of Rome)*

1445–1530 Break (Ventisquero Courtyard and Foyer)

1445–1715 Poster Session P-4B: Statistical Methods & Learning, Motion & Tracking, and Video Analysis II (Multi Purpose Area B)

1. Differential Recurrent Neural Networks for Action Recognition, *Vivek Veeriah, Naifan Zhuang, Guo-Jun Qi*
2. Similarity Gaussian Process Latent Variable Model for Multi-Modal Data Analysis, *Guoli Song, Shuhui Wang, Qingming Huang, Qi Tian*
3. Learning Ensembles of Potential Functions for Structured Prediction With Latent Variables, *Hossein Hajimirsadeghi, Greg Mori*
4. Simultaneous Deep Transfer Across Domains and Tasks, *Eric Tzeng, Judy Hoffman, Trevor Darrell, Kate Saenko*
5. Low Dimensional Explicit Feature Maps, *Ondřej Chum*
6. Unsupervised Learning of Spatiotemporally Coherent Metrics, *Ross Goroshin, Joan Bruna, Jonathan Tompson, David Eigen, Yann LeCun*
7. Multi-Label Cross-Modal Retrieval, *Viresh Ranjan, Nikhil Rasiwasia, C. V. Jawahar*
8. Improving Ferns Ensembles by Sparsifying and Quantising Posterior Probabilities, *Antonio L. Rodriguez, Vitor Sequeira*
9. Beyond Gauss: Image-Set Matching on the Riemannian Manifold of PDFs, *Mehrtash Harandi, Mathieu Salzmann, Mahsa Baktashmotlagh*
10. Unsupervised Domain Adaptation With Imbalanced Cross-Domain Data, *Tzu Ming Harry Hsu, Wei Yu Chen, Cheng-An Hou, Yao-Hung Hubert Tsai, Yi-Ren Yeh, Yu-Chiang Frank Wang*
11. Secrets of Matrix Factorization: Approximations, Numerics, Manifold Optimization and Random Restarts, *Je Hyeong Hong, Andrew Fitzgibbon*
12. Geometry-Aware Deep Transform, *Jiaji Huang, Qiang Qiu, Robert Calderbank, Guillermo Sapiro*
13. Learning Binary Codes for Maximum Inner Product Search, *Fumin Shen, Wei Liu, Shaoting Zhang, Yang Yang, Heng Tao Shen*
14. ML-MG: Multi-Label Learning With Missing Labels Using a Mixed Graph, *Baoyuan Wu, Siwei Lyu, Bernard Ghanem*
15. Zero-Shot Learning via Semantic Similarity Embedding, *Ziming Zhang, Venkatesh Saligrama*
16. Bayesian Model Adaptation for Crowd Counts, *Bo Liu, Nuno Vasconcelos*
17. An NMF Perspective on Binary Hashing, *Lopamudra Mukherjee, Sathya N. Ravi, Vamsi K. Ithapu, Tyler Holmes, Vikas Singh*
18. Multi-View Domain Generalization for Visual Recognition, *Li Niu, Wen Li, Dong Xu*
19. Infinite Feature Selection, *Giorgio Roffo, Simone Melzi, Marco Cristani*
20. Semi-Supervised Zero-Shot Classification With Label Representation Learning, *Xin Li, Yuhong Guo, Dale Schuurmans*
21. A Supervised Low-Rank Method for Learning Invariant Subspaces, *Farzad Siyahjani, Ranya Almohsen, Sinan Sabri, Gianfranco Doretto*
22. Recursive Fréchet Mean Computation on the Grassmannian and its Applications to Computer Vision, *Rudrasis Chakraborty, Baba C. Vemuri*
23. Multi-View Subspace Clustering, *Hongchang Gao, Feiping Nie, Xuelong Li, Heng Huang*

24. Predicting Deep Zero-Shot Convolutional Neural Networks Using Textual Descriptions, *Jimmy Lei Ba, Kevin Swersky, Sanja Fidler, Ruslan salakhutdinov*
25. Structured Feature Selection, *Tian Gao, Ziheng Wang, Qiang Ji*
26. Conditional High-Order Boltzmann Machine: A Supervised Learning Model for Relation Learning, *Yan Huang, Wei Wang, Liang Wang*
27. Learning Image and User Features for Recommendation in Social Networks, *Xue Geng, Hanwang Zhang, Jingwen Bian, Tat-Seng Chua*
28. Dual-Feature Warping-Based Motion Model Estimation, *Shiwei Li, Lu Yuan, Jian Sun, Long Quan*
29. An Adaptive Data Representation for Robust Point-Set Registration and Merging, *Dylan Campbell, Lars Petersson*
30. Local Subspace Collaborative Tracking, *Lin Ma, Xiaoqin Zhang, Weiming Hu, Junliang Xing, Jiwen Lu, Jie Zhou*
31. Learning Spatially Regularized Correlation Filters for Visual Tracking, *Martin Danelljan, Gustav Häger, Fahad Shahbaz Khan, Michael Felsberg*
32. SpeDo: 6 DOF Ego-Motion Sensor Using Speckle Defocus Imaging, *Kensei Jo, Mohit Gupta, Shree K. Nayar*
33. Unsupervised Trajectory Clustering via Adaptive Multi-Kernel-Based Shrinkage, *Hongteng Xu, Yang Zhou, Weiyao Lin, Hongyuan Zha*
34. TRIC-track: Tracking by Regression With Incrementally Learned Cascades, *Xiaomeng Wang, Michel Valstar, Brais Martinez, Muhammad Haris Khan, Tony Pridmore*
35. Recurrent Network Models for Human Dynamics, *Katerina Fragkiadaki, Sergey Levine, Panna Felsen, Jitendra Malik*
36. Contour Flow: Middle-Level Motion Estimation by Combining Motion Segmentation and Contour Alignment, *Huijun Di, Qingxuan Shi, Feng Lv, Ming Qin, Yao Lu*
37. FollowMe: Efficient Online Min-Cost Flow Tracking With Bounded Memory and Computation, *Philip Lenz, Andreas Geiger, Raquel Urtasun*
38. Learning to Divide and Conquer for Online Multi-Target Tracking, *Francesco Solera, Simone Calderara, Rita Cucchiara*
39. Minimizing Human Effort in Interactive Tracking by Incremental Learning of Model Parameters, *Arridhana Ciptadi, James M. Rehg*
40. A Novel Representation of Parts for Accurate 3D Object Detection and Tracking in Monocular Images, *Alberto Crivellaro, Mahdi Rad, Yannick Verdie, Kwang Moo Yi, Pascal Fua, Vincent Lepetit*
41. Linearization to Nonlinear Learning for Visual Tracking, *Bo Ma, Hongwei Hu, Jianbing Shen, Yuping Zhang, Fatih Porikli*
42. Self-Occlusions and Disocclusions in Causal Video Object Segmentation, *Yanchao Yang, Ganesh Sundaramoorthi, Stefano Soatto*
43. Large Displacement 3D Scene Flow With Occlusion Reasoning, *Andrei Zanfir, Cristian Sminchisescu*
44. Co-Interest Person Detection From Multiple Wearable Camera Videos, *Yuewei Lin, Kareem Abdelfatah, Youjie Zhou, Xiaochuan Fan, Hongkai Yu, Hui Qian, Song Wang*
45. Sparse Dynamic 3D Reconstruction From Unsynchronized Videos, *Enliang Zheng, Dinghuang Ji, Enrique Dunn, Jan-Michael Frahm*
46. Category-Blind Human Action Recognition: A Practical Recognition System, *Wenbo Li, Longyin Wen, Mooi Choo Chuah, Siwei Lyu*
47. Temporal Subspace Clustering for Human Motion Segmentation, *Sheng Li, Kang Li, Yun Fu*
48. Weakly-Supervised Alignment of Video With Text, *Piotr Bojanowski, Rémi Lajugie, Edouard Grave, Francis Bach, Ivan Laptev, Jean Ponce, Cordelia Schmid*
49. Learning Temporal Embeddings for Complex Video Analysis, *Vignesh Ramanathan, Kevin Tang, Greg Mori, Li Fei-Fei*
50. Unsupervised Semantic Parsing of Video Collections, *Ozan Sener, Amir R. Zamir, Silvio Savarese, Ashutosh Saxena*
51. Learning Spatiotemporal Features With 3D Convolutional Networks, *Du Tran, Lubomir Bourdev, Rob Fergus, Lorenzo Torresani, Manohar Paluri*
52. Temporal Perception and Prediction in Ego-Centric Video, *Yipin Zhou, Tamara L. Berg*
53. Describing Videos by Exploiting Temporal Structure, *Li Yao, Atousa Torabi, Kyunghyun Cho, Nicolas Ballas, Christopher Pal, Hugo Larochelle, Aaron Courville*
54. Person Re-Identification With Discriminatively Trained Viewpoint Invariant Dictionaries, *Srikrishna Karanam, Yang Li, Richard J. Radke*

55. Storyline Representation of Egocentric Videos With an Applications to Story-Based Search, *Bo Xiong, Gunhee Kim, Leonid Sigal*
56. Sequence to Sequence – Video to Text, *Subhashini Venugopalan, Marcus Rohrbach, Jeffrey Donahue, Raymond Mooney, Trevor Darrell, Kate Saenko*
57. Context Aware Active Learning of Activity Recognition Models, *Mahmudul Hasan, Amit K. Roy-Chowdhury*
58. Action Recognition by Hierarchical Mid-Level Action Elements, *Tian Lan, Yuke Zhu, Amir Roshan Zamir, Silvio Savarese*
59. Selecting Relevant Web Trained Concepts for Automated Event Retrieval, *Bharat Singh, Xintong Han, Zhe Wu, Vlad I. Morariu, Larry S. Davis*
60. Beyond Covariance: Feature Representation With Nonlinear Kernel Matrices, *Lei Wang, Jianjia Zhang, Luping Zhou, Chang Tang, Wanqing Li*
61. Multiresolution Hierarchy Co-Clustering for Semantic Segmentation in Sequences With Small Variations, *David Varas, Mónica Alfaro, Ferran Marques*
62. Objects2action: Classifying and Localizing Actions Without Any Video Example, *Mihir Jain, Jan C. van Gemert, Thomas Mensink, Cees G. M. Snoek*
63. Human Action Recognition Using Factorized Spatio-Temporal Convolutional Networks, *Lin Sun, Kui Jia, Dit-Yan Yeung, Bertram E. Shi*
64. Bayesian Non-Parametric Inference for Manifold Based MoCap Representation, *Fabrizio Natola, Valsamis Ntouskos, Marta Sanzari, Fiora Pirri*
65. Semantic Video Entity Linking Based on Visual Content and Metadata, *Yuncheng Li, Xitong Yang, Jiebo Luo*
66. Love Thy Neighbors: Image Annotation by Exploiting Image Metadata, *Justin Johnson, Lamberto Ballan, Li Fei-Fei*
67. Unsupervised Extraction of Video Highlights Via Robust Recurrent Auto-Encoders, *Huan Yang, Baoyuan Wang, Stephen Lin, David Wipf, Minyi Guo, Baining Guo*
68. Learning Visual Clothing Style With Heterogeneous Dyadic Co-Occurrences, *Andreas Veit, Balazs Kovacs, Sean Bell, Julian McAuley, Kavita Bala, Serge Belongie*
69. Text Flow: A Unified Text Detection System in Natural Scene Images, *Shangxuan Tian, Yifeng Pan, Chang Huang, Shijian Lu, Kai Yu, Chew Lim Tan*

1400–1530 Oral Session O-4C: Video — Actions, Surveillance & Tracking (Del Parque Grand Salon)

Papers in this session are also in Poster Session P-4B.

Chairs: Rahul Sukthankar *(Google Research)*
Jason J. Corso *(Univ. of Michigan)*

Format (13 min. for presentation + 2 min. for questions)

1. Uncovering Interactions and Interactors: Joint Estimation of Head, Body Orientation and F-Formations From Surveillance Videos, *Elisa Ricci, Jagannadan Varadarajan, Ramanathan Subramanian, Samuel Rota Bulò, Narendra Ahuja, Oswald Lanz*
2. Generating Notifications for Missing Actions: Don't Forget to Turn the Lights Off!, *Bilge Soran, Ali Farhadi, Linda Shapiro*
3. Partial Person Re-Identification, *Wei-Shi Zheng, Xiang Li, Tao Xiang, Shengcai Liao, Jianhuang Lai, Shaogang Gong*
4. Shape Interaction Matrix Revisited and Robustified: Efficient Subspace Clustering With Corrupted and Incomplete Data, *Pan Ji, Mathieu Salzmann, Hongdong Li*
5. Multiple Hypothesis Tracking Revisited, *Chanho Kim, Fuxin Li, Arridhana Ciptadi, James M. Rehg*
6. Learning to Track: Online Multi-Object Tracking by Decision Making, *Yu Xiang, Alexandre Alahi, Silvio Savarese*

Thursday, December 17

NOTE: Workshops are in the Marriott Hotel and Courtyard Hotel. The room assignments are for the Marriott Hotel unless otherwise noted.

0730–1800 Registration (Foyer Plaza Gacitua)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

Closing the Loop Between Vision and Language

Organizers: Mohamed Elhoseiny
Ahmed Elgammal
Leonid Sigal

Location: Marriott Gallery

Schedule: Full Day

0825 **Opening Remarks**

0830 **Opening Keynote:** *Larry Zitnick (Microsoft Research)*

0925 **Invited Talk:** *Tamara Berg (Univ. of North Carolina Chapel Hill)*

1000 Morning Break & Poster Session

1040 **Invited Talk:** *Devi Parikh (Virginia Tech)*

1120 **Invited Talk:** *Svetlana Lazebnik (Univ. of Illinois at Urbana-Champaign)*

1200 Lunch (on your own)

1300 **Oral Session**

1425 **Invited Talk:** *Kate Saenko (Univ. of Massachusetts Lowell)*

1500 Afternoon Break & Poster Session

1600 **Closing Keynote:** *Richard Socher (MetaMind)*

1650 **Panel Discussion**

Recovering 6D Object Pose

Organizers: Tae-Kyun Kim
Vincent Lepetit
Carsten Rother
Jiři Matas
Ales Leonardis
Rigas Kouskouridas

Location: Salon A-B-C

Schedule: Full Day

0830 **Opening Remarks & Introduction of Challenges**

0900 **Invited Talk:** Discovering 3D Properties of Objects From Images, *Silvio Savarese (Stanford Univ.)*

0930 **Organiser's Talk:** New Object and Part Representations for 3D Pose Estimation, *Vincent Lepetit (TU Graz)*

1000 Morning Break

1030 **Invited Talk:** Distributions of Diverse Features for Single- and Multiple-View Robot Vision, *Justus Piater (Univ. of Innsbruck)*

1100 **Organiser's Talk:** Learning 6D Object Pose Estimation and Tracking, *Carsten Rother (TU Dresden)*

1130 **Invited Talk:** TBA, *Shahram Izadi (Microsoft Research)*

1200 Lunch (on your own)

1330 **Spotlights**

1400 **Poster Session** (Extended Abstracts)

1500 Afternoon Break

1530 **Organiser's Talk:** TBA, *Jiri Matas (Czech Technical Univ.)*

1600 **Invited Talk:** An Overview of Non-Rigid Dense SLAM and the Challenges Ahead, *Richard Newcombe (Univ. of Washington)*

1630 **Organiser's Talk:** Object Pose and Next-Best-View Estimation by Randomised Forests, *Tae-Kyun Kim (Imperial College London)*

1700 **Organiser's Talk:** UoB Highly Occluded Object Challenge, *Ales Leonardis (Univ. of Birmingham)*

1730 **Discussions, Awards, & Closing Remarks**

Object Understanding for Interaction

Organizers: Joseph J. Lim
Phillip Isola
Abhinav Gupta
Jianxiong Xiao
Ashutosh Saxena

Location: Salon D-E

Schedule: Full Day

0900 **Welcome**
0930 **Invited Talk 1**
1000 **Invited Talk 2**
1030 **Invited Talk 3**
1100 **Student Invited Talks** (four short talks)

1200 Lunch (on your own)

1300 **Poster Session**
1400 **Invited Talk 4**
1430 **Invited Talk 5**

1500 Afternoon Break

1530 **Invited Talk 6**
1600 **Invited Talk 7**
1630 **Panel Discussion**

Extreme Imaging

Organizers: Bill Freeman
Andreas Savakis

Location: Salon F

Schedule: Full Day

0830 **Opening Remarks**
0840 **Invited Speaker:** Gigapixel Camera, *Michael Cohen (Microsoft Research)*
0910 **Invited Speaker:** Extreme Imaging Using Cell Phones, *Marc Levoy (Stanford Univ. & Google)*
0940 A Century of Portraits: A Visual Historical Record of American High School Yearbooks, *Shiry Ginosar, Kate Rakelly, Sarah Sachs, Brian Yin, Alexei A. Efros*

1000 Morning Break

1030 **Invited Speaker:** Exo-Planet Imaging via Causal Error Modeling, *Bernhard Schölkopf (Max Planck Institute)*
1100 **Invited Speaker:** Imaging With the Event Horizon Telescope, *Katie Bouman (MIT)*
1130 Globe Imaging of 3D Motion: Microphysics to Centuries of Change, *Daneil Rosenfeld, Aviad Levis, Itai Bibi, Yoav Schechner, Amir Rosenfeld, David Fischer, Jeffrey Woytach*
1150 Underwater In Situ Microscopy, *Tali Treibitz, Andrew Mullen, Paul Roberts, Jules Jaffe*

1210 Lunch Break (on your own)

1330 **Invited Speaker:** Seeing Through Time, *Steve Seitz (Univ. of Washington & Google)*
1400 **Invited Speaker:** Short Time Imaging, *Wolfgang Heidrich (Univ. of British Columbia)*
1430 Scotopic Visual Recognition, *Bo Chen, Pietro Perona*

1450 Afternoon Break and Posters

- FlatCam: Replacing Lenses With Masks and Computation, *M. Salman Asif, Ali Ayremlou, Ashok Veeraraghavan, Richard Baraniuk, Aswin Sankaranarayanan*
- Low Power Depth and Velocity From a Passive Moving Sensor, *Emma Alexander, Sanjeev J. Koppal, Todd Zickler*
- Estimating a Small Signal in the Presence of Large Noise, *Amy Zhao, Frédo Durand, John Guttag*
- Exploring the Resolution Limit for In-Air Synthetic-Aperture Audio Imaging, *Hisham Bedri, Micha Feigin, Petros T. Boufounos, Ramesh Raskar*
- Occluded Imaging With Time of Flight Sensors, *Achuta Kadambi, Hang Zhao, Boxin Shi, Ramesh Raskar*
- Molecules Clustering at the Nano-Scale: A Graph-Based Approach, *Sebastiano Vascon, Francesca Pennacchietti, Enrica Petrini, Alberto Diaspro, Andrea Barberis, Francesca Cella, Alessio Del Bue*

1600 **Invited Speaker:** Connectome Project, *Ray Jones (Harvard Univ.)*
1630 Crowdpainting With Light: Participatory Imaging at the Big Shot, *Michael Peres, Andreas Savakis*
1650 **Open Discussion/Panel**
1750 **Closing Remarks**

Joint ImageNet and MS COCO Visual Recognition Challenges

Organizers: Yin Cui
Wei Liu
Matteo Ruggero Ronchi
Olga Russakovsky
Jia Deng
Fei-Fei Li
Alex Berg
Tsung-Yi Lin
Genevieve Patterson
Larry Zitnick
Piotr Dollár

Location: Salon G

Schedule: Full Day

0900 **Opening Remarks**

0920 ILSVRC Localization/Classification Challenge

1000 Morning Break & Posters

1030 Video Detection Challenge

1115 Places2 Scene Classification Challenge

1200 Lunch (on your own)

1330 **Keynote Talk:** *Jitendra Malik (Univ. of California at Berkeley)*

1400 MS COCO & ILSVRC Object Detection and Segmentation Challenges

1500 Afternoon Break & Posters

1530 MS COCO & ILSVRC Object Detection and Segmentation Challenges (continued)

1600 **Keynote Talk:** *Ivan Laptev (INRIA Paris)*

1615 **Keynote Talk:** TBA

1630 **Future Plans & Discussion**

1700 **Posters**

3D Reconstruction and Understanding with Video and Sound

Organizers: Dinesh Manocha
Marc Pollefeys
Rif A. Saurous
Rahul Sukthankar
Ruigang Yang

Location: Sierra Nevada

Schedule: Full Day

0800 **Welcome and Introductory Remarks**

S1: Morning Session (0810-1210)

0810 **Invited Talk:** TBA, *Ramesh Raskar (MIT)*

0900 Seeing the Sound: A New Multimodal Imaging Device for Computer Vision, *Andrea Zunino, Marco Crocco, Samuele Martelli, Andrea Trucco, Alessio Del Bue, Vittorio Murino*

0920 Tracking the Active Speaker Based on a Joint Audio-Visual Observation Model, *Israel D. Gebru, Silèye Ba, Georgios Evangelidis, Radu Horaud*

0940 Person Tracking Using Audio and Depth Cues, *Qingju Liu, Teofilo de Campos, Wenwu Wang, Philip Jackson, Adrian Hilton*

1000 Morning Break

1030 **Invited Talk:** TBA, *Dan Ellis (Columbia University)*

1120 **Invited Talk:** Listening to Distances and Hearing Shapes, *Ivan Dokmanic (EPFL/UIUC)*

1210 Lunch (on your own)

S2: Afternoon Session (1320-1730)

1320 **Invited Talk:** Complementarity and Synergy in Video and Audio, *Zhengyou Zhang (Microsoft Research)*

1410 **Invited Talk:** From Direct to Inverse Sound Simulation for Experiential Computing, *Ming Lin (UNC-Chapel Hill)*

1500 Afternoon Break

1530 **Invited Talk:** *Radu Patrice Horaud (INRIA)*

1620 **Panel Discussion:** Moderator — *Jie Yang (NSF)*; Panelists — *Greg Leeming (Intel)*, *Ravish Mehra (Facebook)*, *Avner Sander (Microsoft)*, *Giora Yahav (Microsoft)*

1720 **Closing Remarks**

Computer Vision in Sports

Organizers: Thomas Moeslund
Graham Thomas
Adrian Hilton
Peter Carr

Location: Tacora

Schedule: Full Day

0900 **Welcome**

0910 **Invited Talk:** *Graham Thomas (BBC)*

1000 Morning Break

S1: Oral Session 1 — Segmentation & Tracking (1030-1210)

1030 Tennis Player Segmentation for Semantic Behavior Analysis, *Vito Renò, Nicola Mosca, Massimiliano Nitti, Tiziana D'Orazio, Donato Campagnoli, Andrea Prati, Ettore Stella*

1050 Stroboscopic Image Synthesis of Sports Player From Hand-Held Camera Sequence, *Kunihiro Hasegawa, Hideo Saito*

1110 Soccer Jersey Number Recognition Using Convolutional Neural Networks, *Sebastian Gerke, Karsten Müller, Ralf Schäfer*

1130 Tracking When the Camera Looks Away, *Khurram Soomro, Salman Khokhar, Mubarak Shah*

1150 Attributed Graphs for Tracking Multiple Objects in Structured Sports Videos, *Henrique Morimitsu, Roberto M. Cesar-Jr., Isabelle Bloch*

1210 Lunch (on your own)

1400 **Invited Talk:** *Peter Carr (Disney Research)*

1500 Afternoon Break

S2: Oral Session 2 — Classification & Understanding (1530-1710)

1530 Understanding Sport Activities From Correspondences of Clustered Trajectories, *Francesco Turchini, Lorenzo Seidenari, Alberto Del Bimbo*

1550 Audio-Visual Classification of Sports Types, *Rikke Gade, Mohamed Abou-Zleikha, Mads Græsbøll Christensen, Thomas B. Moeslund*

1610 Injury Mechanism Classification in Soccer Videos, *O.V. Ramana Murthy, Roland Goecke*

1630 Predicting Ball Ownership in Basketball From a Monocular View Using Only Player Trajectories, *Xinyu Wei, Long Sha, Patrick Lucey, Peter Carr, Sridha Sridharan, Iain Matthews*

1650 Depth Compensation Model for Gaze Estimation in Sport Analysis, *Fabricio Batista Narcizo, Dan Witzner Hansen*

1710 **Closing Remarks**

3D Representation and Recognition

Organizers: Yu Xiang
Hao Su
Min Sun
Silvio Savarese
Leonidas Guibas

Location: Alamo C (Courtyard Hotel)

Schedule: Full Day

0900 **Opening Remarks**

0920 **Keynote Speaker:** 3D Shape and Continuous Pose of Unknown Instances of 3D Object Categories, *Kostas Daniilidis (Univ. of Pennsylvania)*

1000 Morning Break

S1: 3D Object Representation and Recognition (1030–1120)

1030 3-D Volumetric Shape Abstraction From a Single 2-D Image, *Pablo Sala, Sven Dickinson*

1055 Building the View Graph of a Category by Exploiting Image Realism, *Attila Szabó, Andrea Vedaldi, Paolo Favaro*

1120 **Keynote Speaker:** Graphics for Vision: 3D Deep Learning From Big RGB-D Data, *Jianxiong Xiao (Princeton Univ.)*

1200 Lunch (on your own)

1330 **Keynote Speaker:** Capturing a Dynamic World From Monocular Video, *Lourdes Agapito (Univ. College London)*

S2: 3D Reconstruction (1410–1500)

1410 Dense Rigid Reconstruction From Unstructured Discontinuous Video, *Karel Lebeda, Simon Hadfield, Richard Bowden*

1435 Reconstruction of Articulated Objects From a Moving Camera, *Kaan Yücer, Oliver Wang, Alexander Sorkine-Hornung, Olga Sorkine-Hornung*

1500 Afternoon Break

S3: 3D Shape Analysis (1530–1555)

1530 Geodesic Convolutional Neural Networks on Riemannian Manifolds, *Jonathan Masci, Davide Boscaini, Michael M. Bronstein, Pierre Vandergheynst*

1555 **Keynote Speaker:** Deep Learning Meets Reconstruction and SLAM, *Ian Reid (Univ. of Oxford)*

1635 **Prize Presentation and Conclusion**

Machine Learning for Intelligent Image and Video Processing

Organizers: Michael Hirsch
Sebastian Nowozin

Location: Alamo A-B (Courtyard Hotel)

Schedule: Half Day — Morning

0855 **Opening Remarks**

0900 **Invited Talk:** *Michael S. Brown (National Univ. of Singapore)*

0940 **Contributed Talk:** Fixed-Lag Parameter Learning for Visual Tracking, *Sergio Hernandez*

1000 Morning Break

1030 **Contributed Talk:** People Counting by Huber Loss Regression, *Jacopo Cavazza, Vittorio Murino*

1050 **Invited Talk:** *Stefan Roth (Technischen Universität Darmstadt)*

1130 **Contributed Talk:** Learning and Transferring Deep ConvNet Representations With Group-Sparse Factorization, *Liangke Gui, Louis-Philippe Morency*

1150 **Concluding Remarks**

Friday, December 18

NOTE: All workshops are in the Marriott Hotel.

0730–1800 Registration (Foyer Plaza Gacitua)

0630–0830 Breakfast (Available in conference hotels for those staying at the hotel.)

Robust Subspace Learning and Computer Vision

Organizers: Thierry Bouwmans
Paul Rodriguez
Namrata Vaswani
Brendt Wohlberg
John Wright
El-Hadi Zahzah

Location: Salon A-B-C

Schedule: Full Day

0830 **Opening Remarks**

S1: Robust Subspace Learning/Clustering (0845-1145)

0845 **Invited Talk:** Globally Optimal Structured Low-Rank Matrix and Tensor Factorization, *René Vidal (Johns Hopkins Univ.)*

0935 A Simple Method for Subspace Estimation With Corrupted Columns, *Viktor Larsson, Carl Olsson, Fredrik Kahl*

1000 Morning Break

1030 Dual Principal Component Pursuit, *Manolis C. Tsakiris, René Vidal*

1055 Sparse Subspace Clustering for Incomplete Images, *Xiao Wen, Linbo Qiao, Shiqian Ma, Wei Liu, Hong Cheng*

1120 Filtrated Spectral Algebraic Subspace Clustering, *Manolis C. Tsakiris, René Vidal*

1145 Lunch (on your own)

S2: Image & Video Processing (1300-1500)

1300 **Invited Talk:** Low-Rank Plus Sparse Dynamic MRI: Accelerated Data Acquisition, Robust Background Suppression and Self-Learning of Inter-Frame Motion Fields, *Ricardo Otazo (New York Univ. School of Medicine)*

1350 Pose and Expression-Coherent Face Recovery in the Wild, *Xavier P. Burgos-Artizzu, Joaquin Zepeda, François Le Clerc, Patrick Pérez*

1415 Robust Matrix Regression for Illumination and Occlusion Tolerant Face Recognition, *Jianchun Xie, Jian Yang, Jianjun Qian, Ying Tai*

1435 Image Saliency Detection With Sparse Representation of Learnt Texture Atoms, *Lai Jiang, Mai Xu, Zhaoting Ye, Zulin Wang*

1500 Afternoon Break

1530 Object Extraction From Bounding Box Prior With Double Sparse Reconstruction, *Lingzheng Dai, Jundi Ding, Jian Yang, Fanlong Zhang, Junxia Li*

1550 Visual Tracking via Nonnegative Regularization Multiple Locality Coding, *Fanghui Liu, Tao Zhou, Jie Yang, Irene Y.H. Gu*

S3: Background/Foreground Separation (1610-1810)

1610 **Invited Talk:** Incremental Robust Principal Component Analysis for Video Background Modeling: Theory, Applications and Jitter Invariant Extension, *Paul Rodriguez (Pontificia Universidad Católica del Perú)*

1650 Multi-Resolution Dynamic Mode Decomposition for Foreground/Background Separation and Object Tracking, *J. Nathan Kutz, Xing Fu, Steve L. Brunton, N. Benjamin Erichson*

1710 Background Subtraction via Superpixel-Based Online Matrix Decomposition With Structured Foreground Constraints, *Sajid Javed, Seon Ho Oh, Andrews Sobral, Thierry Bouwmans, Soon Ki Jung*

1730 Adaptive Low Rank Approximation for Tensors, *Xiaofei Wang, Carmeliza Navasca*

1750 Online Stochastic Tensor Decomposition for Background Subtraction in Multispectral Video Sequences, *Andrews Sobral, Sajid Javed, Soon Ki Jung, Thierry Bouwmans, El-hadi Zahzah*

1810 **Panel Discussion**

300 Videos in the Wild: Facial Landmark Tracking in-the-Wild

Organizers: Stefanos Zafeiriou
Georgios Tzimiropoulos
Maja Pantic
Jie Shen
Grigorios Chrysos
Jean Kossaifi

Location: Salon D-E-F

Schedule: Full Day

0930 **Welcome**

0935 Offline Deformable Face Tracking in Arbitrary Videos, *Grigoris G. Chrysos, Epameinondas Antonakos, Stefanos Zafeiriou, Patrick Snape*

1000 Morning Break

1030 Facial Landmark Tracking by Tree-Based Deformable Part Model Based Detector, *Michal Uřičář, Vojtěch Franc, Václav Hlaváč*

1055 Multi-View Constrained Local Models for Large Head Angle Facial Tracking, *Georgia Rajamanoharan, Timothy F. Cootes*

1120 Shape Augmented Regression Method for Face Alignment, *Yue Wu, Qiang Ji*

1145 Facial Landmark Detection via Progressive Initialization, *Shengtao Xiao, Shuicheng Yan, Ashraf A. Kassim*

1210 Facial Shape Tracking via Spatio-Temporal Cascade Shape Regression, *Jing Yang, Jiankang Deng, Kaihua Zhang, Qingshan Liu*

1235 Lunch (on your own)

1435 The First Facial Landmark Tracking In-the-Wild Challenge: Benchmark and Results, *Jie Shen, Stefanos Zafeiriou, Grigoris G. Chrysos, Jean Kossaifi, Georgios Tzimiropoulos, Maja Pantic*

1500 **Award and Closing Remarks**

The Future of Real-Time SLAM: Sensors, Processors, Representations, and Algorithms

Organizers: Stefan Leutenegger
Thomas Whelan
Richard A. Newcombe
Andrew J. Davison

Location: Salon G

Schedule: Full Day

0900 **Invited Talks 1–4**

1030 Morning Break

1100 **Invited Talk 5**

1130 **Live Demonstrations**

1300 Lunch (on your own)

1400 **Invited Talks 6–9**

1530 Afternoon Break

1600 **Invited Talks 10–11**

1700 **Panel Discussion**

Web-Scale Vision and Social Media

Organizers: Lamberto Ballan
Marco Bertini
Thomas Mensink

Location: Sierra Nevada

Schedule: Full Day

0830 **Welcome and Opening Remarks**

0845 **Invited Talk:** TBA, *Abhinav Gupta (Carnegie Mellon Univ.)*

Oral Session (0930-1015)

0930 Scalable Sketch-Based Image Retrieval Using Color Gradient Features, *Tu Bui, John Collomosse*

0945 Fisher Encoded Convolutional Bag-Of-Windows for Efficient Image Retrieval and Social Image Tagging, *Tiberio Uricchio, Marco Bertini, Lorenzo Seidenari, Alberto Del Bimbo*

1000 Geometric Mining: Scaling Geometric Hashing to Large Datasets, *Andrew Gilbert, Richard Bowden*

1000 Morning Break

1030 **Poster Session** (already published or ongoing works)

- Predicting Geo-Informative Attributes in Large-Scale Image Collections Using Convolutional Neural Networks, *Stefan Lee, Haipeng Zhang, David J. Crandall (WACV 2015)*
- Visual Recognition by Learning From Web Data: A Weakly Supervised Domain Generalization Approach, *Li Niu, Wen Li, Dong Xu (CVPR 2015)*
- Love Thy Neighbors: Image Annotation by Exploiting Image Metadata, *Justin Johnson, Lamberto Ballan, Li Fei-Fei (ICCV 2015)*
- VideoStory: A New Multimedia Embedding for Few-Example Recognition and Translation of Events, *Amirhossein Habibian, Thomas Mensink, Cees G. M. Snoek (ACM MM 2014)*
- Web-Scale Image Clustering Revisited, *Yannis Avrithis, Yannis Kalantidis, Evangelos Anagnostopoulos, Ioannis Z. Emiris (ICCV 2015)*
- Collaborative Feature Learning From Social Media, *Chen Fang, Hailin Jin, Jianchao Yang, Zhe Lin (CVPR 2015)*
- ActivityNet: A Large-Scale Video Benchmark for Human Activity Understanding, *Fabian Caba Heilbron, Victor Escorcia, Bernard Ghanem, Juan Carlos Niebles (CVPR 2015)*
- Socializing the Semantic Gap: A Comparative Survey on Image Tag Assignment, Refinement and Retrieval, *Xirong Li, Tiberio Uricchio, Lamberto Ballan, Cees G.M. Snoek, Alberto Del Bimbo (Ongoing work)*
- Synthesizing Illumination Mosaics From Internet Photo-Collections, *Dinghuang Ji, Enrique Dunn, Jan-Michael Frahm (ICCV 2015)*
- Learning Image and User Features for Recommendation in Social Networks, *Xue Geng, Hanwang Zhang, Jingwen Bian, Tat-Seng Chua (ICCV 2015)*
- Semantic Video Entity Linking Based on Visual Content and Metadata, *Yuncheng Li, Xitong Yang, Jiebo Luo (ICCV 2015)*
- Temporal Localization of Fine-Grained Actions in Videos by Domain Transfer From Web Images, *Chen Sun, Sanketh Shetty, Rahul Sukthankar, Ram Nevatia (ACM MM 2015)*
- Semantically-Driven Automatic Creation of Training Sets for Object Recognition, *Dong-Seon Cheng, Francesco Setti, Nicola Zeni, Roberta Ferrario, Marco Cristani (CVIU 2015)*
- Augmenting Strong Supervision Using Web Data for Fine-Grained Categorization, *Zhe Xu, Shaoli Huang, Ya Zhang, Dacheng Tao (ICCV 2015)*
- Selecting Relevant Web Trained Concepts for Automated Event Retrieval, *Bharat Singh, Xintong Han, Zhe Wu, Vlad I. Morariu, Larry S. Davis (ICCV 2015)*
- Unsupervised Tube Extraction Using Transductive Learning and Dense Trajectories, *Mihai Marian Puscas, Enver Sangineto, Dubravko Culibrk, Nicu Sebe (ICCV 2015)*
- Adaptive Hashing for Fast Similarity Search, *Fatih Cakir, Stan Sclaroff*
- Image Classification and Retrieval are ONE, *Lingxi Xie, Richang Hong, Bo Zhang, Qi Tian (ACM ICMR 2015)*

1130 **Invited Talk:** What Objects Tell About Actions, *Cees G.M. Snoek (Univ. of Amsterdam)*

1215 Lunch Break (on your own)

1330 **Invited Talk:** TBA, *Jiebo Luo (Univ. of Rochester)*

1415 **Poster Session** (already published or ongoing works)
(Same papers presented in the morning poster session)

1500 Afternoon Break

1530 **Invited Talk:** TBA

1615 **Closing Remarks**

Vision from Satellite to Street

Organizers: Anil Cheriyadat
Shawn Newsam
Mei Han
Jiangye Yuan

Location: Tacora

Schedule: Half Day — Morning

0855 **Opening Remarks**

0900 **Invited Talk:** *Jiebo Luo (Univ. of Rochester)*

0940 Single Frame Based Video Geo-Localisation Using Structure Projection, *Christoph Bodensteiner, Sebastian Bullinger, Simon Lemaire, Michael Arens*

1000 Morning Break

1030 **Invited Talk:** *Amir R. Zamir (Stanford Univ.)*

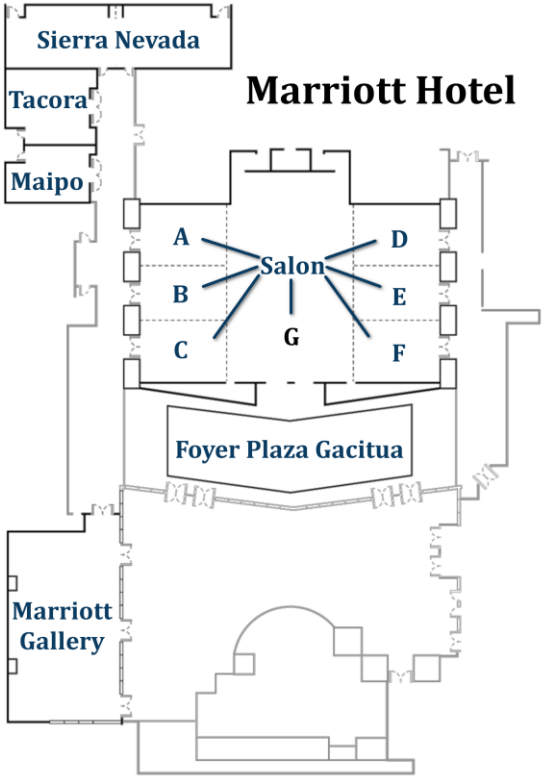
1110 Semantic Cross-View Matching, *Francesco Castaldo, Amir Zamir, Roland Angst, Francesco Palmieri, Silvio Savarese*

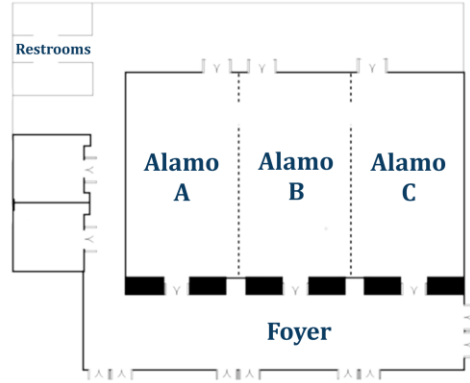
1130 **Invited Talk:** *Julian Ibarz (Google)*

1210 **Concluding Remarks**

Workshops/Tutorials Hotels

(Maps for ICCV 2015 Workshop & Tutorials)

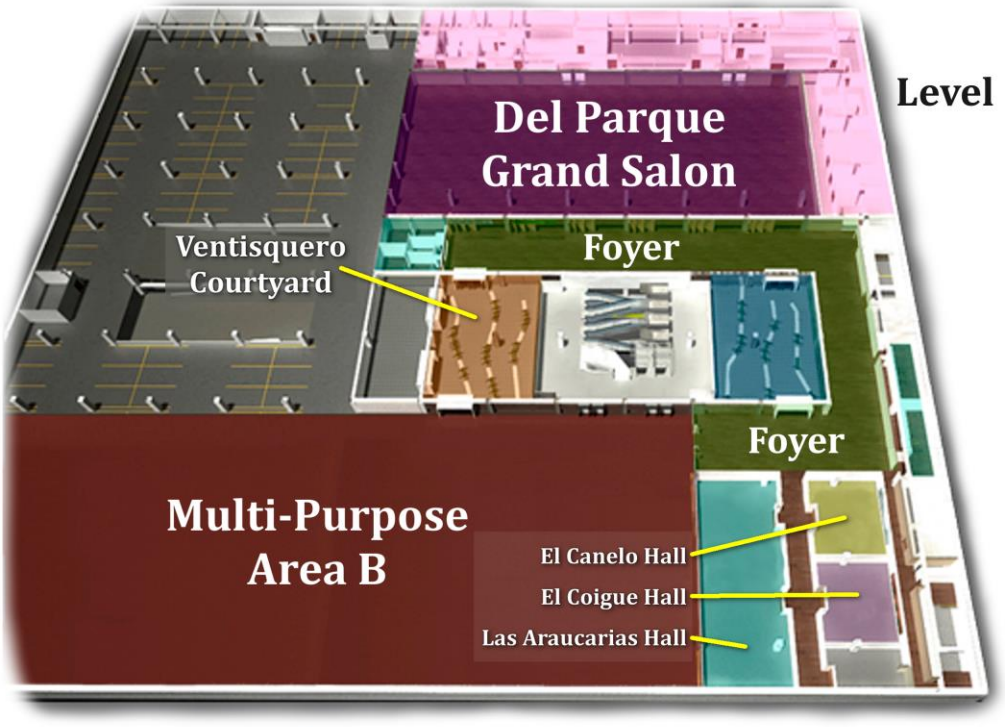




Workshops and tutorials are in the Marriott Hotel and Courtyard Hotel. Locations listed in this Pocket Guide are in the Marriott Hotel unless indicated otherwise.

CentroParque Convention Center

(Main Conference Map)



DECEMBER 11-18, 2015

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