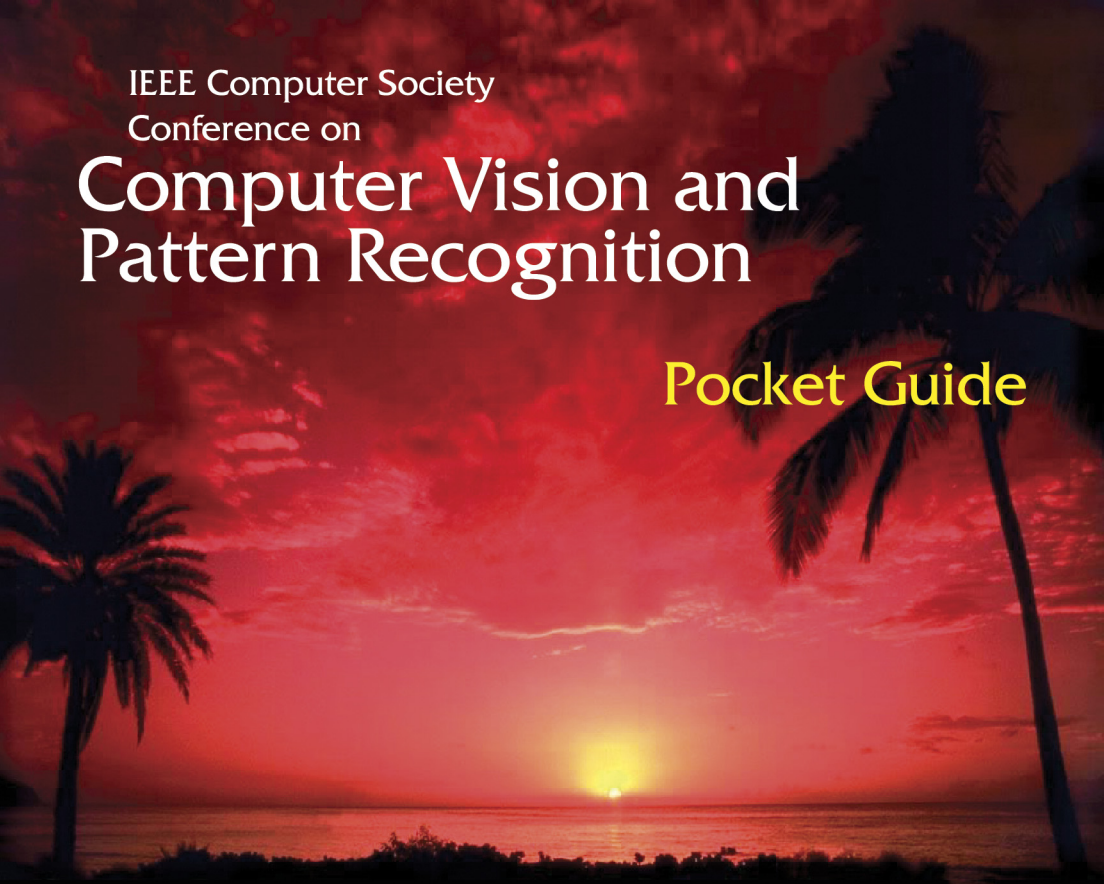

IEEE Computer Society
Conference on

Computer Vision and Pattern Recognition

Pocket Guide

CVPR 2009
MIAMI

June 20-25, 2009

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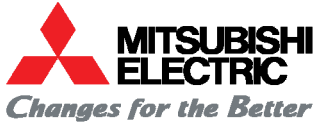

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Message from the Program and General Chairs

Welcome to Miami and the 27th IEEE Conference on Computer Vision and Pattern Recognition (CVPR). Following in the tradition of its distinguished predecessors, CVPR 2009 has a number of events co-located with the main conference, including short courses and workshops. A passport system allows registrants easy access to these other events, and their proceedings are available on the CVPR 2009 DVD.

The 2009 edition of this conference was over two years in the making. After evaluating several properties in the Miami area, we selected the Fontainebleau Resort due to its excellent conference facilities and beachfront location. The Fontainebleau also has an historical connection to the CVPR community, as the third CVPR meeting was held here in 1986. Within the past two years, the Fontainebleau has undergone an extensive $1 billion renovation and expansion. The modernized facility retains many of the historical architectural features introduced by noted architect Morris Lapidus, who designed the original property in the early 1950's. Following the tradition of recent CVPR meetings, we have obtained ample space for poster presentations and have integrated the poster space into the overall layout of our meeting rooms to encourage interactions.

Over the past few years, the number of submissions to CVPR has grown considerably, and this year was no exception. We received 1,464 complete submissions by the November 20, 2008 deadline. No extensions were given, and papers that did not meet the submission criteria were rejected and removed from the review process. Based upon a study of previous vision meetings and discussions with previous Program Chairs and other senior members of the community, we decided to assemble the largest Area Chair (ACs) committee in the history of CVPR, to facilitate a thorough review process. Our goal was simple: to conduct a rigorous and fair double-blind review process, and provide the best possible feedback to the authors. A lower load for the ACs was a significant step in this direction. We invited 46 well-known vision researchers as ACs, a significant number of whom had previous AC experience. We ensured that the AC committee provided balanced coverage of the diverse sub-areas within computer vision, based on trends from the last few meetings. The committee included a healthy mixture of junior and senior researchers. Our goal was to assign each AC fewer than 35 papers, and in return, we obtained commitments from all ACs to closely shepherd the reviewing process. Based on input from these ACs and previous organizers, we assembled a Papers Review Committee of 749 members from the broader computer vision community. We also set up an aggressive schedule for the review process, in order to ensure that the decisions for CVPR 2009 were available before the ICCV 2009 deadline in March, 2009.

To facilitate the online review process, we elected to utilize Microsoft Research's CMT System (cmt.research.microsoft.com). This was another first for CVPR, and a substantial change from the tried and tested system used in past CVPR/ICCV/ECCV meetings. We were driven by the need to have a stable and professionally-maintained system capable of supporting a large meeting with a large number of papers and reviews, with reliability and security as major requirements. This decision required an extensive engagement with the CMT team in order to adapt their software to support our multi-tiered review process (consisting of ACs and Reviewers). We received excellent advice and guidance from the developers of the previous years' system, and invited Jiri Matas to be our Review Software Advisor. The CMT Team (Yuri Siradeghyan, Sanjay Agrawal, and Gaoxiang Xu) spent considerable time and effort to adapt the system fully to our needs. In addition to better security, complete backups and reliability, and amazing service by the CMT team, we now have a system with expanded functionality that is available for future use by other vision meetings. One feature of the system that the committee used extensively this year was the anonymous discussion board for Reviewers and ACs to discuss the reviews. This allowed for frank discussion amongst the reviewers and enabled each AC to obtain a better understanding of the reviewer comments.

Here is a brief snapshot of how the review process unfolded. After the paper deadline, the papers were distributed to the Area Chairs, who in turn identified at least 5 reviewers for each paper. 3 reviewers were automatically selected per paper, taking into consideration conflict information and reviewer load constraints. The Papers Review Committee was given seven weeks to complete the reviews, at which time the ACs stepped back in to finish their work: consolidating reviews, initiating discussions for clarification, and making recommendations for decisions on papers. The author

rebuttals were visible to the reviewers, so that author feedback could be taken into account in the final discussions. The ACs were assigned in pairs, in order to provide an additional level of verification and consistency of reviews and proposed decisions. The process was designed to ensure that every paper and its reviews were looked at by at least two ACs. To further support a thorough review process, at the AC Meeting in Atlanta, we divided the ACs into four panels, with no two ACs within a panel having any conflicts. In these panels, ACs were asked to discuss the more difficult cases, specifically papers with divergent scores. The ACs also proposed and discussed candidate papers for ORALs within the panel sessions. In essence, the goal of the panel sessions was to discuss the best and borderline papers in order to make informed decisions. The Program Chairs served as the panel chairs (one of the General Chairs was asked to step in as a panel chair for one of the panels) and worked hard to maintain consistency between the panels. The Program Chairs required that all decisions be made by at least 2 ACs and, as needed, by the whole panel. A consensus of the entire panel was sought on the most difficult cases. The Program Chairs did not over-rule any decisions by the ACs, but asked for clarification on decisions where it was needed, and requested detailed consolidation reports to justify all decisions. Thanks to detailed reviews by the reviewers and the hard work of each AC, the process went very smoothly. As promised, the Program Chairs did not submit any papers to CVPR 2009, allowing them to work without any direct conflicts throughout the review process. Additionally, the respective Program Chairs were excluded from any decisions associated with papers from their affiliated institutions. The double-blind nature of the CVPR review process was strictly maintained throughout the review process.

The ACs accepted 61 papers as ORALs (4.2%) and 322 papers as POSTERs (22%), with an overall acceptance rate of 26.2%. 20 papers were recommended to the Awards Committee, which consisted of senior members of the vision community with no conflicts with the candidate papers. This committee selected 4 award papers after the final camera ready copies were submitted. These awards papers will be presented in the only single-track session of the main conference.

In terms of the acceptance criteria, our policy was to assemble a distinguished group and to let them make decisions by consensus. While we provided the ACs with a minimum number of orals, there was no upper bound, either on the number of orals or posters. While it is inevitable in a process of this scale that some incorrect decisions were made, we believe that the overall process worked well, and the feedback we received remains overwhelmingly positive.

Another addition to the program for CVPR 2009 is the introduction of a series of Doctoral Spotlight Sessions, to be held at the beginning of each morning poster session. The purpose of the Spotlight Sessions is to give recently-graduated or soon-to-be-graduating Ph.D. students with an accepted poster at CVPR 2009 an opportunity to give a brief talk introducing their posters, on the day that they will be presented. Prospective employers and other interested parties are encouraged to attend the Spotlight Sessions and then follow-up with the individual students at their poster presentations. We are grateful to Kristen Grauman, our Volunteers and Student Activities Chair, for organizing and conducting this special session.

CVPR 2009 has followed the recently-established custom of publishing its proceedings in DVD form. Special thanks go to our Publication co-Chairs, Patrick Flynn and Eric Mortensen, for their tremendous dedication and effort that resulted in a smooth publication process. As in the past, all published papers in the main conference and associated workshops will be indexed by the IEEE, and available through the IEEE Digital Library.

We wish to thank our Steering Committee (Larry Davis, Andrew Fitzgibbon, David Lowe, Harry Shum, Tanveer Syeda-Mahmood, and Ramin Zabih), the previous Program and General Chairs, and other senior researchers in computer vision, for very helpful advice on a wide range of topics. Special thanks go to our Finance and Registration Chairs, Terry and Ginger Boult, for their indispensible and wide-ranging contributions to the planning and running of this meeting. We also thank the Chairs for Corporate Relations (Anthony Hoogs), Demos (Jan-Michael Frahm), Local Arrangements (Shahriar Negahdaripour and Marshall Tappen), Short Courses (Yanxi Liu), Videos (Gabriel Brostow), Website (Matthew Flagg), and Workshops (Rahul Sukthankar), along with the workshop organizers and short course presenters, for their contributions in making CVPR 2009 a premier event. Our primary thanks to everyone

involved in the submission process: the ACs, reviewers and authors. Special thanks go to the CMT team for working hard to ensure a smooth review process and for helping to set up a new reviewing system for CVPR. We believe that the final output of this intensive process is well worth the enormous effort behind it.

CVPR 2009 Organizing Committee

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Matthew Turk
Tinne Tuytelaars
Luc Van Gool
Daphna Weinshall
Richard Wildes
Ming-Hsuan Yang
Larry Zitnick

Friday, June 19

General Information

1900–2100 Registration (Swirl)

Saturday, June 20

General Information

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

Egocentric Vision

Location: Splash 5-8

Schedule:

S1: Keynote Session I (1030–1115)

1030 Keynote: First-Person, Inside-Out Vision, *Takeo Kanade (Carnegie Mellon Univ.)*

S2: Objects & Activities I (1115–1215)

1115 Egocentric Recognition of Handled Objects: Benchmark and Analysis, *Xiaofeng Ren, Matthai Philipose*

1145 EyeWatchMe—3D Hand and Object Tracking for Inside Out Activity Analysis, *Li Sun, Ulrich Klank, Michael Beetz*

1215 Lunch Break

S3: Keynote Session II (1315–1400)

1315 **Keynote:** TBD

S4: Objects & Activities II (1400–1500)

1400 Temporal Segmentation and Activity Classification from First-person Sensing, *Ekaterina H. Spriggs, Fernando De la Torre, Martial Hebert*

1430 High Level Activity Recognition using Low Resolution Wearable Vision, *Sudeep Sundaram, Walterio W. Mayol-Cuevas*

1500 Afternoon Break

S5: Scenes & Environments I (1530–1630)

1530 Image Matching in Large Scale Indoor Environment, *Hongwen Kang, Alexie A. Efros, Martial Hebert, Takeo Kanade*

1600 Learning Texton Models for Real-time Scene Context, *Alexander Flint, Ian Reid, David Murray*

S6: Scenes & Environments II (1630–1730)

1630 AWEAR 2.0 System: Omni-directional Audio-Visual Data Acquisition and Processing, *Michal Havlena, Andreas Ess, Wim Moreau, Akihiko Torii, Michal Jančošek, Tomáš Pajdla, Luc Van Gool*

1700 Self Lane Assignment Using Egocentric Smart Mobile Camera for Intelligent GPS Navigation, *Tianshi Gao, Hamid Aghajan*

Mathematical Methods in Biomedical Image Analysis (MMBIA)

Location: Splash 9-10

Schedule:

0830 Opening Remarks

S1: Oral Session 1—Registration (0840–1010)

0840 TIMER: Tensor Image Morphing for Elastic Registration, *Pew-Thian Yap, Guorong Wu, Hongtu Zhu, Weili Lin, Dinggang Shen*

0910 An Optimal Control Approach for Deformable Registration, *Gabriel L. Hart, Christopher Zach, Marc Niethammer*

0940 Image Registration by Minimization of Mapping Complexity, *Andriy Myronenko, Xubo Song*

1010 Morning Break

S2: Poster Session 1—Detection & Segmentation (1030–1215)

- Automatic Detection of Body Parts in X-Ray Images, *Vincent Jeanne, Devrim Unay, Vincent Jacquet*
- Automatic Multiple Sclerosis Detection based on Integrated Square Estimation, *Jundong Liu, Charles D. Smith, Himachandra Chebrolu*
- Cortical Enhanced Tissue Segmentation of Neonatal Brain MR Images Acquired by a Dedicated Phased Array Coil, *Feng Shi, Pew-Thian Yap, Yong Fan, Jie-Zhi Cheng, Lawrence L. Wald, Guido Gerig, Weili Lin, Dinggang Shen*
- Echocardiographic Contour Extraction with Local and Global Priors through Boosting and Level Sets, *Ayse Betul Oktay, Yusuf Sinan Akgul*
- Regularization of Diffusion Tensor Field Using Coupled Robust Anisotropic Diffusion, *Songyuan Tang, Yong Fan, Hongtu Zhu, Pew-Thian Yap, Wei Gao, Weili Lin, Dinggang Shen*
- Learning to Segment Using Machine-Learned Penalized Logistic Models, *Yong Yue, Hemant D. Tagare*
- The Shading Zone Problem in Geodesic Voting and its Solutions for the Segmentation of Tree Structures. Application to the Segmentation of Microglia Extensions, *Youssef Rouchdy, Laurent D. Cohen*
- Tunable Tensor Voting Improves Grouping of Membrane-Bound Macromolecules, *Leandro A. Loss, George Bebis, Bahram Parvin*
- Automatic Symmetry-integrated Brain Injury Detection in MRI Sequences, *Yu Sun, Bir Bhanu, Shiv Bhanu*
- Dense Iterative Contextual Pixel Classification using Kriging, *Melanie Ganz, Marco Loog, Sami Brandt, Mads Nielsen*

1215 Lunch Break

S3: Oral Session 2—Segmentation (1330–1500)

1330 3D Segmentation of Rodent Brains Using Deformable Models and Variational Methods, *Shaoting Zhang, Jinghao Zhou, Xiaoxu Wang, Sukmoon Chang, Dimitris N. Metaxas, George Pappas, Foteini Delis, Nora D. Volkow, Gene-Jack Wang, Panayotis K. Thanos, Chandra Kambhamettu*

1400 Accurate Estimation of Pulmonary Nodule's Growth Rate in CT Images with Nonrigid Registration and Precise Nodule Detection and Segmentation, *Yuanjie Zheng, Chandra Kambhamettu, Thomas Bauer, Karl Steiner*

1430 Distance Guided Selection of the Best Base Classifier in an Ensemble with Application to Cervigram Image Segmentation, *Wei Wang, Xiaolei Huang*

1500 Afternoon Break

S4: Poster Session 2— Deformable Models & Registration (1520–1630)

- Quasiconvex Alignment of Multimodal Skin Images for Quantitative Dermatology, *Siddharth K. Madan, Kristin J. Dana, Oana G. Cula*
- Non-Rigid Registration between Histological and MR Images of the Prostate: A Joint Segmentation and Registration Framework, *Yangming Ou, Dinggang Shen, Michael Feldman, John Tomaszewski, Christos Davatzikos*
- Groupwise Morphometric Analysis based on Morphological Appearance Manifold, *Nai-Xiang Lian, Christos Davatzikos*
- GPU-accelerated, Gradient-free MI Deformable Registration for Atlas-based MR Brain Image Segmentation, *Xiao Han, Lyndon S. Hibbard, Virgil Willcut*
- Deformable Tree Models for 2D and 3D Branching Structures Extraction, *Julien Mille, Laurent D. Cohen*
- Bicycle Chain Shape Models, *Stefan Sommer, Aditya Tatu, Chen Chen, Dan R. Jørgensen, Marleen de Bruijne, Marco Loog, Mads Nielsen, François Lauze*
- Automatic Estimation of Left Ventricular Dysfunction from Echocardiogram Videos, *David Beymer, Tanveer Syeda-Mahmood, Arnon Amir, Fei Wang, Scott Adelman*
- 3-D Reconstruction and Measurement of Microtubules from Multiple Angle-Total Internal Reflection Fluorescence Microscopy, *Qian Yang, Alexander Karpikov, Derek Toomre, James Duncan*

S5: Oral Session 3—Tractography, Molecular & Cellular Image Analysis (1630–1800)

1630 3D Stochastic Completion Fields for Fiber Tractography, *Parya Momayyezsiahkal, Kaleem Siddiqi*

1700 Tracking of Cell Populations to Understand their Spatio-Temporal Behavior in Response to Physical Stimuli, *David House, Matthew Walker, Zheng Wu, Joyce Wong, Margrit Betke*

1730 Robust Estimation of Stem Cell Lineages Using Local Graph Matching, *Min Liu, Amit K.Roy Chowdhury, Venugopala Reddy Gonehal*

Object Tracking & Classification in and Beyond the Visible Spectrum (OTCBVS)

Location: Splash 11-12

Schedule:

0810 Welcome Message from the Chairs

S1: Keynote Speaker and Invited Papers (0820–1010)

0820 **Keynote:** An Overview of Object Tracking in EO and IR Imagery, *Dr. Mubarak Shah (Univ. of Central Florida)*

0920 The HFB Face Database for Heterogeneous Face Biometrics Research, *Stan Z. Li, Zhen Lei, Meng Ao*

0940 Object Recognition in 3D Lidar Data with Recurrent Neural Network, *Danil V. Prokhorov*

1000 Morning Break

S2: Vehicle Recgonition, Fusion, Laser Imagery (1030–1110)

1030 Fusion of a Camera and a Laser Range Sensor for Vehicle Recognition, *Shirmila Mohottala, Shintaro Ono, Masataka Kagesawa, Katsushi Ikeuchi*

1050 Vehicle Matching and Recognition under Large Variations of Pose and Illumination, *Tingbo Hou, Sen Wang, Hong Qin*

S3: Pedestrian Recongition in Far Infrared (1110–1150)

1110 Feature Based Person Detection beyond the Visible Spectrum, *Kai Jüngling, Michael Arens*

1130 Pedestrian Association and Localization in Monocular FIR Video Sequence, *Mayank Bansal, Shunguang Wu, Jayan Eledath*

Announcements & Best Paper Award (1150–1200)

1200 Lunch Break

S4: Target Tracking (1340–1420)

1340 Appearance Learning by Adaptive Kalman Filters for FLIR Tracking, *Vijay Venkataraman, Guoliang Fan, Xin Fan, Joseph P. Havlicek*

1400 Dual Domain Auxiliary Particle Filter with Integrated Target Signature Update, *Colin M. Johnston, Nick Mould, Joseph P. Havlicek, Guoliang Fan*

S5: Background Modeling, Surveillance, and Defense (1420–1500)

1420 Fuzzy Statistical Modeling of Dynamic Backgrounds for Moving Object Detection in Infrared Videos, *Fida El Baf, Thierry Bouwmans, Bertrand Vachon*

1440 Background Subtraction in Varying Illuminations Using an Ensemble Based on an Enlarged Feature Set, *Brendan Klare, Sudeep Sarkar*

1500 Afternoon Break

S5: Background Modeling, Surveillance, & Defense (continued) (1520–1600)

1520 Robust Real-Time 3D Modeling of Static Scenes Using Solely a Time-of-Flight Sensor, *Johannes Feulner, Jochen Penne, Eva Kollorz, Joachim Hornegger*

1540 A Rapidly Deployable Virtual Presence Extended Defense System, *Mark W. Koch, Casey Giron, Hung D. Nguyen*

S6: Smart Sensors (1600–1640)

1600 Geometric Sequence (GS) Imaging with Bayesian Smoothing for Optical and Capacitive Imaging Sensors, *Kuntal Sengupta, Fatih Porikli*

1620 A Smart Sensor with Hyperspectral/Range Fovea and Panoramic Peripheral View, *Tao Wang, Zhigang Zhu, Harvey Rhody*

S7: Hyperspectral Image Analysis (1640–1720)

1640 A Machine Learning Approach for Material Detection in Hyperspectral Images, *Raphaël Marée, Benjamin Stévens, Pierre Geurts, Yves Guyyern, Philippe Mack*

1700 An Affine Invariant Hyperspectral Texture Descriptor Based Upon Heavy-tailed Distributions and Fourier Analysis, *Pattaraporn Khuwuthyakorn, Antonio Robles-Kelly, Jun Zhou*

S8: Open Discussion & Closing Remarks (1720–1750)

1720 Evaluation remarks, Plan for 2010, Sponsorship, etc.

Sparse Representation and Its Applications in High-Dimensional Pattern Recognition

Organizers: Yi Ma
John Wright
Allen Y. Yang

Time: 0830-1230 (Half Day-Morning)

Location: Splash 15-16

Description: In the past several years, there have been exciting breakthroughs in the study of sparse representation of high-dimensional signals. That is, a signal is represented as a linear combination of relatively few base elements in an over-complete dictionary. Much of the excitement centers on the discovery that a sufficiently sparse linear representation can be correctly and efficiently computed by convex optimization (i.e. the ℓ^0/ℓ^1 equivalence) or greedy algorithms, even though this problem is NP-hard in the general case. Further studies have shown that such high-dimensional sparse signals can be accurately recovered from drastically smaller number of (even randomly selected) linear measurements.

These results have already caused a small revolution in the community of statistical signal processing as they provide entirely new perspectives to some of the fundamental principles and doctrines in signal processing such as the sampling bounds and the choice of bases for signal representation and reconstruction. We believe that these new results and the general mathematical principles behind them are of great interest to the computer vision and pattern recognition community. Through this tutorial, we intend to introduce the disruptive tools from sparse representation theory and their many successful applications to computer vision and image processing. Particularly, the goal of the lecture is threefold:

- Provide a comprehensive understanding about the mathematical theory of sparse representation and compressive sensing.
- Introduce the basic results and algorithms from sparse representation and their applications to high-dimensional pattern recognition problems in computer vision that should be of great interest to the broad audience of CVPR.
- Highlight challenging open questions for solving real-world applications in the cross-disciplinary area between sparse representation and pattern recognition.

To achieve the above goal, the lecture will first provide a detailed treatment about the foundation of the sparse representation theory and enumerate several `1-minimization routines that effectively recover sparse representation from highdimensional practical data sets. As one of the first applications to introduce sparse representation to the pattern recognition community, the problem of face recognition will be used as a cornerstone example to illustrate the striking effectiveness of these new tools (see the website for more info: http://perception.csl.uiuc.edu/recognition/Home.html). Finally, the lectures will touch basis to expand the scope of the discussion in several other areas such as motion segmentation, image processing, and distributed sensor networks.

Prerequisites: The course is at the intermediate level which requires the audience to have some basic knowledge in graduate-level signal processing, pattern recognition, and linear algebra. The discussion about the applications of face recognition, motion segmentation, and sensor networks will be self-contained, and past research experience in these specific domains is not crucial for the audience.

Advanced Techniques for Face-based Biometrics

Organizer: Massimo Tistarelli

Time: 0830-1230 (Half Day-Morning)

Location: Splash 13-14

Description: Face recognition is among the most natural means of identification for humans. This technology, re-discovered in the last 20 years, has shown great potential both in terms of acceptability from the users and applicability to a variety of scenarios. Moreover, recently developed algorithms achieve remarkable recognition performances.

Among the advantages of face-based human identification is the capability to capture data from a distance, such as from surveillance cameras. For this reason, coupling surveillance with identification is becoming more attractive. Other applications, such as forensics, require different approaches which can be directly incorporated into the face matching algorithms. A recent approach to face recognition is based on the transduction rather than on the deduction of the face similarity by using discriminative methods based on likelihood ratios rather than on fixed scores. The perceptual strategies followed by the human visual system also provide hints for the design of automatic identification systems.

A comprehensive outline of face-based biometrics will be provided and its relation to biological systems and the human visual system. An in-depth analysis of state-of-the-art algorithms for face-image analysis will follow, including face detection & tracking, landmark localization, feature extraction, face representation and classification.

The most relevant issues and problems will be raised, providing practical solutions and algorithms responding to them. Attention will be given to the most advanced and new techniques for face representation and classification, as well as current approaches. Finally, the lecture will present three relevant and novel issues: the use of face image sequences for exploiting the time domain, the extension to 3D face analysis, and how to cope with ageing and data quality.

Photo Tourism and IM2GPS: 3D Reconstruction and Geolocation of Internet Photo Collections

Organizers: Noah Snavely
James Hays

Time: 0830-1230 (Half Day-Morning)

Location: Splash 1-4

Description: The Internet has become an increasingly massive, interesting, and useful source of imagery for computer vision and graphics applications. This course will explore recent developments in 3D vision for Internet photo collections. We will focus on two systems: Photo Tourism and im2gps, which aim to automatically recover geometry and location information from these diverse, unstructured sets of photos. These systems help us answer such questions as: where was this photo taken? What was it looking at?

The first part of this course will describe Photo Tourism. Photo Tourism is a structure from motion (SfM) system for reconstructing camera positions and scene geometry from unorganized photo collections, and demonstrates that SfM techniques can be successfully applied to photos downloaded from the Internet. We will cover the basics of the SfM problem, and talk about the design and implementation considerations of Photo Tourism that are critical for handling unordered collections robustly and efficiently. Photo Tourism also enables new interfaces for exploring and visualizing photo collections in 3D.

Structure from motion generally recovers relative scene geometry; how can we figure out where in the world the photos were taken? The second part of the course will focus on the im2gps system for geolocating photographs. We will discuss the use of Internet image data sources and related logistical issues, the geolocation of single images or sequences of photos, and the use of geography estimates for deeper image understanding tasks such as object detection.

Kernel Methods in Computer Vision

Organizers: Christoph H. Lampert
Matthew B. Blaschko

Time: 1400-1800 (Half Day-Afternoon)

Location: Splash 15-16

Description: Since their invention in the early 1990s, support vector machines (SVMs) have evolved into the currently most popular classification tool. Because SVMs have few parameters and because efficient software packages are freely available, SVMs today are used not only in computer science, but also in engineering and many other disciplines where binary classification is required. Other methods that also rely on the kernel principle have attracted less attention outside of machine learning research: regression, dimensionality reduction, clustering and much more can be formulated in a way that makes use of the same kernel framework as SVM do. In summary, this family of techniques is called "kernel methods".

The short course will give an introduction into SVMs as well as less well known methods. We will mostly leave aside the vast amount of theory that exists in the field and instead take a geometric point of view, concentrating on feature spaces as a common link between all kernel methods. Apart from the common methods for classification, regression and dimensionality reductions, we will go beyond the textbooks and give an introduction into two recent developments that have the potential to become the "next big thing": multiple kernel learning (MKL) and learning with structured output spaces. Although kernel methods are application agnostic, we will access the field from a Computer Vision point of view, giving examples from the current computer vision literature for illustration. As we will see, kernel methods are applicable to a wide range of problems, including some where one wouldn't have expected them, e.g. feature selection or the learning of structure for graphical models.

Light Fields: Present & Future (Computational Photography)

Organizers: Ramesh Raskar
Se Baek Oh
Anthony Acardi
Zhengyun Zhang

Time: 1400-1800 (Half Day-Afternoon)

Location: Splash 1-4

Description: The ray-based 4D lightfield representation, based on simple 3D geometric principles, has led to a range of new algorithms and applications in Computer Vision and Graphics. They include digital refocusing, depth estimation, synthetic aperture, and glare reduction within a camera or using an array of cameras. The lightfield representation is, however, inadequate to describe interactions with diffractive or phase-sensitive optical elements. Fourier optics principles are used to represent wavefronts with additional phase information. This course reviews the current and future directions in exploiting higher dimensional representation of light transport. We hope the course will inspire researchers in computer vision comfortable with ray-based analysis to develop new tools and algorithms based on joint exploration of geometric and wave optics concepts.

Video Search Engines

Organizers: Arnold W. M. Smeulders
Cees G. M. Snoek

Time: 1400-1800 (Half Day-Afternoon)

Location: Splash 13-14

Description: We discuss the problems of video search, present methods how to achieve state-of-the-art performance, and indicate how to obtain improvements in the near future. We give an overview of the developments and future trends in the field on the basis of the TRECVID competition—the leading competition for video search engines run by NIST—where we have consistently scored a top-three performance over the last five years.

The scientific topic of video search is dominated by four major challenges:

- The semantic gap between a visual concept and its lingual representation
- The sensory gap between an object and it many appearances due to the accidental sensing conditions
- The model gap between the amount of notions in the world and the capacity to learn them
- The interface gap between the tiny window the screen offers to the amount of data

The semantic gap is bridged by forming a dictionary of visual concept detectors. The largest ones to date consist of hundreds of concepts excluding concept-tailored algorithms. It would simply take too long to achieve. Instead, we come closer to the ideal of one computer vision algorithm tailored automatically to the purpose at hand by employing example data to learn from. We discuss the advantages and limitations of a machine learning approach from examples. We show for what type of concept the approach is likely to succeed or fail. In compensation for the absence of concept-specific (geometric or appearance) models, we emphasize the importance of a good feature sets. They form the basis of the observational model by all possible color, shape, texture or structure invariant features help to characterize the concept at hand. Apart from good features, the other essential component is state-of- the-art machine learning in order to get the most out of the learning data.

We integrate the features and machine learning aspects into a complete concept-based video search engine, which has successfully competed in TRECVID. The system includes computer vision, machine learning, information retrieval, and human-computer interaction. We follow the video data as they flow through the computational processes. We start from fundamental visual features, covering local shape, texture, color, motion and the crucial need for invariance. Then, we explain how invariant features can be used in concert with kernel-based supervised learning methods to arrive at a concept detector. We discuss the important role of fusion on a feature, classifier, and semantic level to improve the robustness and general applicability of detectors. We end our component-wise decomposition of video search engines by explaining the complexities involved in delivering a limited set of uncertain concept detectors to an inpatient user. For each of the components we review state-of-the-art solutions in literature, each having different characteristics and merits.

Comparative evaluation of methods and systems is imperative to appreciate progress. We discuss the data, tasks, and results of TRECVID, the leading benchmark. In addition, we discuss the many derived community initiatives in creating annotations, baselines, and software for repeatable experiments. We conclude the course with our perspective on the many challenges and opportunities ahead for the computer vision and pattern recognition community.

Sunday, June 21

General Information

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

Internet Vision

Location: Splash 9-10

Schedule:

S1: Invited Talk I (0840–0920)

0840 Invited Talk: TBD, *David Forsyth*

S2: Image Cataloging (0920–1010)

0920 Finding Iconic Images, *Tamara L. Berg, Alexander C. Berg*

0945 Towards Automated Large Scale Discovery of Image Families, *Mohamed Aly, Peter Welinder, Mario Munich, Pietro Perona*

1010 Morning Break

S3: Novel Applications (1030–1145)

1030 Page Frame Segmentation for Contextual Advertising in Print on Demand Books, *Hanning Zhou, Zongyi Liu*

1055 Cutout Search: Putting a Name to the Picture, *Dhruv Batra, Adarsh Kowdle, Devi Parikh, Tsuhan Chen*

1120 Computer Vision on Tap, *Kevin Chiu, Ramesh Raskar*

1145 Lunch Break

S4: Invited Talk II (1330–1410)

1330 Invited Talk: TBD, *Ying Shan*

S5: Video (1410–1500)

1410 Adventures in Archiving and Using Three Years of Webcam Images, *Nathan Jacobs, Walker Burgin, Richard Speyer, David Ross, Robert Pless*

1435 Towards Unlocking Web Video: Automatic People Tracking and Clustering, *Alex Holub, Pierre Moreels, Atiq Islam, Andrei Makhanov, Rui Yang*

1500 Afternoon Break

S6: Geo Location (1520–1610)

1520 Geo-location Inference from Image Content and User Tags, *Andrew Gallagher, Dhiraj Joshi, Jie Yu, Jiebo Luo*

1545 Alignment of 3D Point Clouds to Overhead Images, *Ryan S. Kaminsky, Noah Snavely, Steven M. Seitz, Richard Szeliski*

S7: Invited Talk III (1610–1640)

1600 Invited Talk: TBD, *Fei-Fei Li*

Semantic Learning & Applications in Multimedia (SLAM)

Location: Splash 13-14

Schedule:

1330 **Invited Talk:** TBD, *Fei-Fei Li (Princeton/Stanford.)*

1430 Human Action Recognition with Extremities as Semantic Posture Representation, *Elden Yu, J. K. Aggarwal*

1450 Incremental On-line semantic Indexing for Image Retrieval in Dynamic Databases, *Suman Karthik, Chandrika Pulla, C. V. Jawahar*

1510 Afternoon Break

1530 **Invited Talk:** TBD, *Erik Learned-Miller (Univ. of Massachusetts)*

1630 A Level Set-based Global Shape Prior and Its Application to Image Segmentation, *Lei Zhang, Qiang Ji*

1650 Panel Discussion on Multimedia Grand Challenge

Feature Detectors & Descriptors: The State of the Art and Beyond

Location: Splash 11-12

Schedule:

1315 Opening Remarks & Talk, *Krystian Mikolajczyk, Jiri Matas, Tinne Tuytelaars, Cordelia Schmid*

S1: Local Features I (1345–1500)

1345 Lonely but Attractive: Sparse Color Salient Points for Object Retrieval and Categorization, *Julian Stöttinger, Allan Hanbury, Theo Gevers, Nicu Sebe*

1410 SUSurE: Speeded Up Surround Extremas Feature Detector and Descriptor for Realtime Applications, *Mosalam Ebrahimi, Walterio W. Mayol-Cuevas*

1435 Robust Feature Matching in 2.3µs, Simon Taylor, Edward Rosten, Tom Drummond

1500 Afternoon Break

S2: Keynote Session (1520–1610)

1520 **Keynote:** Experiments with Feature Points, *Vincent Lepetit (EPFL)*

S3: Local Features II (1610–1725)

1610 Fast Features for Time Constrained Object Detection, *Gary Overett, Lars Petersson*

1635 HALF-SIFT: High-Accurate Localized Features for SIFT, *Kai Cordes, Oliver Müller, Bodo Rosenhahn, Jörn Ostermann*

1700 Incremental Bayesian Learning of Feature Points from Natural Images, *Miika Toivanen, Jouko Lampinen*

S4: Feature Evaluation & Discussion (1725–1830)

1725 Discussion and Feature Evaluation Report, *Krystian Mikolajczyk, Jiri Matas, Tinne Tuytelaars, Cordelia Schmid*

Visual Place Categorization (VPC)

Location: Splash 5-8

Schedule:

845 Introduction

900 **Keynote**: Places, From the Robot's Point of View, *Benjamin Kuipers (Univ. of Michigan)*

945 Natural Scene Categorization: Behaviors, Brains, and Computers, *Fei-Fei Li (Princeton/Stanford)*

1010 Morning Break

1030 Place Recognition and Lifelong Maps, *Kurt Konolige (Willow Garage)*

1055 What Should We Mean by "Scene"? *David Forsyth (UIUC)*

1120 Models for Joint Labeling of Objects and Scenes, *Bernt Schiele (TU Darmstadt)*

1145 A New Dataset of Home Interiors for Visual Place Categorization, *Jianxin Wu (Georgia Tech)*

1210 Lunch Break

1345 TBD, *Alyosha Efros (CMU)*

1410 Semantic Modeling of Places using Objects, *Frank Dellaert (Georgia Tech)*

1435 The Role of Spatial, Visual and Linguistic Context in Environmental Modelling, *Nicholas Roy (MIT)*

1500 Afternoon Break

1520 Context-based Vision for Place and Object Recognition, *Antonio Torralba (MIT)*

1545 Combining Automated Visual Search and Place Categorization, *Jim Little (Univ. of British Columbia)*

1610 Combining Appearance and Geometry for Efficient Scene Recognition, *Svetlana Lazebnik (Univ. of North Carolina)*

1635 A Region-based Approach to Scene Understanding, *Stephen Gould (Stanford)*

1700 Panel Discussion

Stochastic Image Grammars (SIG)

Location: Splash 1-4

Schedule:

0830 Welcome and Opening Remarks, *Song-Chun Zhu*

0835 Basic Review of Grammars, *Sinisa Todorovic*

0850 **Keynote:** Generative Hierarchical Models for Image Analysis, *Stuart Geman (Brown Univ.)*

0930 **Keynote:** Learning a Hierarchical Compositional Representation of Multiple Object Classes, *Aleš Leonardis (Univ. of Ljubljana)*

0950 A Bottom-up and Top-down Optimization Framework for Learning a Compositional Hierarchy of Object Classes, *Sanja Fidler, Marko Boben, Aleš Leonardis*

1010 Morning Break

1030 **Keynote:** Is There a General Structure for Grammars?, *David Mumford (Brown Univ.)*

1105 **Keynote:** Recursive Compositional Models: Representation, Learning, and Inference, *Alan Yuille (UCLA) (with Long (Leo) Zhu)*

1145 Learning and Inference using Hierarchical Compositional Models, *Iasonas Kokkinos, Alan Yuille*

1200 Lunch Break

1330 Predicate Logic based Image Grammars for Complex Pattern Recognition, *Vinay Shet, Maneesh Singh, Claus Bahlmann, Visvanathan Ramesh*

1350 Image Parsing with Stochastic Grammar: The Lotus Hill Dataset and Inference Scheme, *Benjamin Yao, Xiong Yang, Tianfu Wu*

1420 **Keynote:** A Syntax for Image Understanding, *Narendra Ahuja (Univ. of Illinois at Urbana-Champaign)*

1505 Afternoon Break

1520 Stochastic Representation and Recognition of High-level Group Activities: Describing Structural Uncertainties in Human Activities, *Michael S. Ryoo, J. K. Aggarwal*

1540 **Keynote:** Beyond One-to-One Feature Correspondence: The Need for Many-to-Many Matching and Image Abstraction, *Sven Dickinson (Univ. of Toronto)*

1625 Panel Discussion

Computer Vision on GPUs

Organizers: Jan-Michael Frahm
P. J. Narayanan
Joe Stam

Speakers: Michael Houston (AMD)
Justin Hensley (AMD)
Tim Foley or Oleg Maslov (Intel)

Time: 0900-1800 (Full Day)

Location: Splash 15-16

Description: GPUs have emerged as a useful computing co-processor that is readily available and economical. The latest commodity GPUs are rated for a peak performance of around 1 TFLOPs at the cost of $400 or so. The recent demand for high performance techniques has led to the adaptation of GPUs for various computer vision algorithms. Many computer vision algorithms are well-suited for processing on the GPU due to the match of the data-parallel computations to many operations on images. Recent advances such as CUDA and the OpenCL standard have the potential to accelerate the use of GPUs in many areas for more general purpose computing, including Computer vision. This course aims to familiarize computer vision researchers with the emerging and exciting area of fast computer vision algorithms on the GPU. It will give an introduction to the programming of the current state-of-the-art hardware to enable participants to employ the unique capabilities of GPUs.

The proposed tutorial will provide a reasonably broad and in-depth introduction into GPU programming for Computer Vision. It also will include recent developments like OpenCL, Larrabee architecture, and other high-performance platforms.

The following is the schedule of topics that will be covered over the course of a full day:

Schedule:

0900 Introduction

0930 Stream/GPU Computing: Universal concepts

- Heterogeneous computing
- Data-Parallel Programming

1010 Coffee Break

1030 Multi-tier thread structure: Overview of CUDA/OpenCL

1050 CUDA: Overview of Architecture & Prog:

- Nvidia architecture
- CUDA: syntax, concepts, optimization, etc.

1200 Lunch break

1330 OpenCL: Overview of Architecture & Prog:

- ATI architecture overview
- OpenCL: syntax, concepts, optimization, etc.

1430 Application Case studies: (120 min)

1500 Coffee break

1520 Application Case studies: (continued)

1610 Parallel Computer Vision:

- Larrabee and Many-core architectures
- CellBE, FPGAs
- Vision on throughput computing devices

1700 Panel discussion

Monday, June 22

0800–0900 Breakfast (Luster Gallerie)

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

0900–1020 Image & Video Search (Sparkle East)

Chair – Kristen Grauman *(Univ. of Texas at Austin)*

1. Pose Search: Retrieving People using their Pose, *Vittorio Ferrari, Manuel Marín-Jiménez, Andrew Zisserman*
2. Efficient Representation of Local Geometry for Large Scale Object Retrieval, *Michal Perďoch, Ondřej Chum, Jiří Matas*
3. Geometric min-Hashing: Finding a (Thick) Needle in a Haystack, *Ondřej Chum, Michal Perďoch, Jiří Matas*
4. Bundling Features for Large Scale Partial-Duplicate Web Image Search, *Zhong Wu, Qifa Ke, Michael Isard, Jian Sun*

0900–1020 Optical Flow & Image Registration (Sparkle West)

Chair – Richard Wildes *(York Univ.)*

1. Contextual Flow, *Ying Wu, Jialue Fan*
2. Large Displacement Optical Flow, *Thomas Brox, Christoph Bregler, Jitendra Malik*
3. Image Registration by Minimization of Residual Complexity, *Andriy Myronenko, Xubo Song*
4. Learning General Optical Flow Subspaces for Egomotion Estimation and Detection of Motion Anomalies, *Richard Roberts, Christian Potthast, Frank Dellaert*

1020–1030 Morning Break (Luster Gallerie)

1030–1100 Doctoral Spotlight (Sparkle East)

1030–1230 Demos (Splash 1-3)

- "Déjà vu" – Visual Search for Efficient Reidentification of Pedestrians in Huge Surveillance Databases, *Csaba Beleznai, Martin Winter, Martin Hirzer, Horst Bischof, Josef Birchbauer*
- CuZero: Interactive Video Search with Real-Time Query Formulation and Query Space Navigation, *Eric Zavesky, Shih-Fu Chang*
- Learning Real-Time MRF Inference for Image Denoising, *Adrian Barbu*
- A Web-based 3D Object Retrieval platform, *Ioannis Pratikakis, Panagiotis Papadakis, Miltiadis Koutsokeras, Stavros Perantonis*
- Personalized Noninvasive Electrical and Mechanical Imaging of Heart Diseases, *Linwei Wang, Ken C.L. Wong, Pengcheng Shi*
- Retrographic Sensing for the Measurement of Surface Texture and Shape, *Micah K. Johnson, Edward H. Adelson*
- A World-Wide Landmark Recognition Engine with Web Learning, *Yantao Zheng, Ming Zhao, Yang Song, Hartwig Adam, Ulrich Buddemeier, Alessandro Bissacco, Fernando Brucher, Tat-Seng Chua, Hartmut Neven, Jay Yagnik*
- Robust feature matching in 2.3 µs, *Simon Taylor, Edward Rosten, Tom Drummond*
- Interactive Cosegmentation by Touch, *Dhruv Batra, Adarsh Kowdle, Devi Parikh, Jiebo Luo, Tsuhan Chen*

1030–1230 Exhibits (Splash 9-12)

- IET Journals
- Now Publishers
- Springer
- Morgan & Claypool Publishers
- Cambridge University Press
- TYZX
- Point Grey Research, Inc.

1030–1230 Poster Session 1 (Splash 9-16 & Ocean Promenade East/West)

1. A Unified Active and Semi-Supervised Learning Framework for Image Compression, *Xiaofei He, Ming Ji, Hujun Bao*
2. Digital Face Makeup by Example, *Dong Guo, Terence Sim*
3. Hardware-Efficient Belief Propagation, *Chia-Kai Liang, Chao-Chung Cheng, Yen-Chieh Lai, Liang-Gee Chen, Homer H. Chen*
4. Directed Assistance for Ink-Bleed Reduction in Old Documents, *Zheng Lu, Zheng Wu, Michael S. Brown*
5. Vanishing Point Detection for Road Detection, *Hui Kong, Jean-Yves Audibert, Jean Ponce*
6. Blind Motion Deblurring from a Single Image using Sparse Approximation, *Jian-Feng Cai, Hui Ji, Chaoqiang Liu, Zuowei Shen*
7. Human Age Estimation Using Bio-inspired Features, *Guodong Guo, Guowang Mu, Yun Fu, Thomas S. Huang*
8. Cancelable Iris Biometrics and Using Error Correcting Codes to Reduce Variability in Biometric Data, *Sanjay Kanade, Dijana Petrovska-Delacrétaz, Bernadette Dorizzi*
9. Physiological Face Recognition Is Coming of Age, *Pradeep Buddharaju, Ioannis Pavlidis*
10. Support Vector Machines in Face Recognition with Occlusions, *Hongjun Jia, Aleix M. Martinez*
11. Boosted Multi-Task Learning for Face Verification With Applications to Web Image and Video Search, *Xiaogang Wang, Cha Zhang, Zhengyou Zhang*
12. Volterrafaces: Discriminant Analysis using Volterra Kernels, *Ritwik Kumar, Arunava Banerjee, Baba C. Vemuri*
13. Learning Mappings for Face Synthesis from Near Infrared to Visual Light Images, *Jie Chen, Dong Yi, Jimei Yang, Guoying Zhao, Stan Z. Li, Matti Pietikäinen*
14. Shape Evolution for Rigid and Nonrigid Shape Registration and Recovery, *Junyan Wang, Kap Luk Chan*
15. SIFT-Rank: Ordinal Description for Invariant Feature Correspondence, *Matthew Toews, William Wells III*
16. Picking the best DAISY, *Simon Winder, Gang Hua, Matthew Brown*
17. Learning Similarity Measure for Multi-Modal 3D Image Registration, *Daewon Lee, Matthias Hofmann, Florian Steinke, Yasemin Altun, Nathan D. Cahill, Bernhard Schölkopf*
18. Constrained Marginal Space Learning for Efficient 3D Anatomical Structure Detection in Medical Images, *Yefeng Zheng, Bogdan Georgescu, Haibin Ling, S. Kevin Zhou, Michael Scheuering, Dorin Comaniciu*
19. Shape Analysis with Conformal Invariants for Multiply Connected Domains and its Application to Analyzing Brain Morphology, *Yalin Wang, Xianfeng Gu, Tony F. Chan, Paul M. Thompson*
20. Automated Feature Extraction for Early Detection of Diabetic Retinopathy in Fundus Images, *Saiprasad Ravishankar, Arpit Jain, Anurag Mittal*
21. A Robust Parametric Method for Bias Field Estimation and Segmentation of MR Images, *Chunming Li, Chris Gatenby, Li Wang, John C. Gore*
22. Markerless Motion Capture with Unsynchronized Moving Cameras, *Nils Hasler, Bodo Rosenhahn, Thorsten Thormählen, Michael Wand, Juergen Gall, Hans-Peter Seidel*
23. Early Spatiotemporal Grouping with a Distributed Oriented Energy Representation, *Konstantinos G. Derpanis, Richard P. Wildes*
24. Discriminatively Trained Particle Filters for Complex Multi-Object Tracking, *Rob Hess, Alan Fern*
25. ImageNet: A Large-Scale Hierarchical Image Database, *Jia Deng, Wei Dong, Richard Socher, Li-Jia Li, Kai Li, Fei-Fei Li*
26. Understanding Images of Groups of People, *Andrew C. Gallagher, Tsuhan Chen*
27. Efficient Algorithms for Subwindow Search in Object Detection and Localization, *Senjian An, Patrick Peursum, Wanquan Liu, Svetha Venkatesh*
28. Learning Mixed Templates for Object Recognition, *Zhangzhang Si, Haifeng Gong, Ying Nian Wu, Song-Chun Zhu*
29. Fast Concurrent Object Localization and Recognition, *Tom Yeh, John J. Lee, Trevor Darrell*
30. Shape-based Object Recognition in Videos Using Synthetic 3D Object Models, *Alexander Toshev, Ameesh Makadia, Kostas Daniilidis*

31. A Collaborative Benchmark for Region of Interest Detection Algorithms, *Tz-Huan Huang, Kai-Yin Cheng, Yung-Yu Chuang*
32. Pedestrian Detection: A Benchmark, *Piotr Dollár, Christian Wojek, Bernt Schiele, Pietro Perona*
33. Learning Trajectory Patterns by Clustering: Experimental Studies and Comparative Evaluation, *Brendan Morris, Mohan Trivedi*
34. Learning Color and Locality Cues for Moving Object Detection and Segmentation, *Feng Liu, Michael Gleicher*
35. Increased Discrimination in Level Set Methods with Embedded Conditional Random Fields, *Dana Cobzas, Mark Schmidt*
36. Extraction of Tubular Structures over an Orientation Domain, *Mickaël Péchaud, Renaud Keriven, Gabriel Peyré*
37. LidarBoost: Depth Superresolution for ToF 3D Shape Scanning, *Sebastian Schuon, Christian Theobalt, James Davis, Sebastian Thrun*
38. Efficient Planar Graph Cuts with Applications in Computer Vision, *Frank R. Schmidt, Eno Töppe, Daniel Cremers*
39. Locally Constrained Diffusion Process on Locally Densified Distance Spaces with Applications to Shape Retrieval, *Xingwei Yang, Suzan Köknar-Tezel, Longin Jan Latecki*
40. Shape Classification Through Structured Learning of Matching Measures, *Longbin Chen, Julian J. McAuley, Rogerio S. Feris, Tibério S Caetano, Matthew Turk*
41. Surface Feature Detection and Description with Applications to Mesh Matching, *Andrei Zaharescu, Edmond Boyer, Kiran Varanasi, Radu Horaud*
42. Robust Multi-Class Transductive Learning with Graphs, *Wei Liu, Shih-Fu Chang*
43. Multiplicative Nonnegative Graph Embedding, *Changhu Wang, Zheng Song, Shuicheng Yan, Lei Zhang, Hong-Jiang Zhang*
44. Image Categorization with Spatial Mismatch Kernels, *Zhiwu Lu, Horace H. S. Ip*
45. Multiple Instance Feature for Robust Part-based Object Detection, *Zhe Lin, Gang Hua, Larry S. Davis*
46. Recognizing Indoor Scenes, *Ariadna Quattoni, Antonio Torralba*
47. Constrained Clustering via Spectral Regularization, *Zhenguo Li, Jianzhuang Liu, Xiaoou Tang*
48. Manifold Discriminant Analysis, *Ruiping Wang, Xilin Chen*
49. Stereo Matching in the Presence of Sub-Pixel Calibration Errors, *Heiko Hirschmueller, Stefan Gehrig*
50. Mutual Information-based Stereo Matching Combined with SIFT Descriptor in Log-chromaticity Color Space, *Yong Seok Heo, Kyoung Mu Lee, Sang Uk Lee*
51. Joint Depth and Alpha Matte Optimization via Fusion of Stereo and Time-of-Flight Sensor, *Jiejie Zhu, Miao Liao, Ruigang Yang, Zhigeng Pan*
52. Learning Semantic Visual Vocabularies Using Diffusion Distance, *Jingen Liu, Yang Yang, Mubarak Shah*
53. Topology Dictionary with Markov Model for 3D Video Content-Based Skimming and Description, *Tony Tung, Takashi Matsuyama*
54. Learning Optimized MAP Estimates in Continuously-Valued MRF Models, *Kegan G. G. Samuel, Marshall Tappen*

1230–1400 Lunch on your own

1400–1500 Stereo (Sparkle East)

Chair – Kyros Kutulakos *(Univ. of Toronto)*

1. Stereo Matching with Nonparametric Smoothness Priors in Feature Space, *Brandon M. Smith, Li Zhang, Hailin Jin*
2. Spatiotemporal Stereo via Spatiotemporal Quadric Element (Stequel) Matching, *Mikhail Sizintsev, Richard P. Wildes*
3. A Stereo Approach that Handles the Matting Problem via Image Warping, *Michael Bleyer, Margrit Gelautz, Carsten Rother, Christoph Rhemann*

1400–1500 Image Enhancement & Restoration (Sparkle West)

Chair – Michael S. Brown *(National Univ. of Singapore)*

1. High Dynamic Range Image Reconstruction from Hand-held Cameras, *Pei-Ying Lu, Tz-Huan Huang, Meng-Sung Wu, Yi-Ting Cheng, Yung-Yu Chuang*
2. Contextual Restoration of Severely Degraded Document Images, *Jyotirmoy Banerjee, Anoop M. Namboodiri, C. V. Jawahar*
3. Polarization: Beneficial for Visibility Enhancement?, *Tali Treibitz, Yoav Y. Schechner*

1500–1510 Coffee Break (Luster Gallerie)

1510–1540 Doctoral Spotlight (Sparkle East)

1510–1710 Demos (Splash 1-3)

- See Monday morning Demos

1510–1710 Exhibits (Splash 9-12)

- See Monday morning Exhibits

1510–1710 Poster Session 2 (Splash 9-16 & Ocean Promenade East/West)

1. Learning Partially-Observed Hidden Conditional Random Fields for Facial Expression Recognition, *Kai-Yueh Chang, Tyng-Luh Liu, Shang-Hong Lai*
2. Real-time Vehicle Detection for Highway Driving, *Ben Southall, Mayank Bansal, Jayan Eledath*
3. Dictionary-Free Categorization of Very Similar Objects via Stacked Evidence Trees, *Gonzalo Martínez Muñoz, Wei Zhang, Nadia Payet, Sinisa Todorovic, Natalia Larios Delgado, Asako Yamamuro, David Lytle, Andrew Moldenke, Eric Mortensen, Robert Paasch, Linda Shapiro, Thomas G. Dietterich*
4. Real-Time $O(1)$ Bilateral Filtering, *Qingxiong Yang, Kar-Han Tan, Narendra Ahuja*
5. Learning Photometric Invariance from Diversified Color Model Ensembles, *Jose M. Álvarez, Theo Gevers, Antonio López*
6. Combining Powerful Local and Global Statistics for Texture Description, *Yong Xu, SiBin Huang, Hui Ji, Cornelia Fermüller*
7. Physics-based Edge Evaluation for Improved Color Constancy, *Arjan Gijsenij, Theo Gevers, Joost van de Weijer*
8. Reducing JointBoost-Based Multiclass Classification to Proximity Search, *Alexandra Stefan, Vassilis Athitsos, Quan Yuan, Stan Sclaroff*
9. Towards a Practical Face Recognition System: Robust Registration and Illumination by Sparse Representation, *Andrew Wagner, John Wright, Arvind Ganesh, Zihan Zhou, Yi Ma*
10. Maximizing Intra-individual Correlations for Face Recognition Across Pose Differences, *Annan Li, Shiguang Shan, Xilin Chen, Wen Gao*
11. Robustifying Eye Center Localization by Head Pose Cues, *Roberto Valenti, Zeynep Yucel, Theo Gevers*
12. Illumination and Spatially Varying Specular Reflectance from a Single View, *Kenji Hara, Ko Nishino*
13. Relighting Objects from Image Collections, *Tom Haber, Christian Fuchs, Philippe Bekaert, Hans-Peter Seidel, Michael Goesele, Hendrik P. A. Lensch*

14. Color Estimation from a Single Surface Color, *Rei Kawakami, Katsushi Ikeuchi*
15. A Unified Model of Specular and Diffuse Reflectance for Rough, Glossy Surfaces, *William A. P. Smith, Edwin R. Hancock*
16. Robust Shadow and Illumination Estimation Using a Mixture Model, *Alexandros Panagopoulos, Dimitris Samaras, Nikos Paragios*
17. New Appearance Models for Natural Image Matting, *Dheeraj Singaraju, Carsten Rother, Christoph Rhemann*
18. Similarity Metrics and Efficient Optimization for Simultaneous Registration, *Christian Wachinger, Nassir Navab*
19. StaRSaC: Stable Random Sample Consensus for Parameter Estimation, *Jongmoo Choi, Gérard Medioni*
20. Shape Comparison Using Perturbing Shape Registration, *Yifeng Jiang, Erin Edmiston, Fei Wang, Hilary P. Blumberg, Lawrence H. Staib, Xenophon Papademetris*
21. Robust Guidewire Tracking in Fluoroscopy, *Peng Wang, Terrence Chen, Ying Zhu, Wei Zhang, S. Kevin Zhou, Dorin Comaniciu*
22. Optimization of Landmark Selection for Cortical Surface Registration, *Anand Joshi, David Shattuck, Dimitrios Pantazis, Quanzheng Li, Hanna Damasio, Richard Leahy*
23. Active Volume Models for 3D Medical Image Segmentation, *Tian Shen, Hongsheng Li, Zhen Qian, Xiaolei Huang*
24. Fuzzy-Cuts: A Knowledge-Driven Graph-Based Method for Medical Image Segmentation, *Deepak R. Chittajallu, Gerd Brunner, Uday Kurkure, Raja P. Yalamanchili, Ioannis A. Kakadiaris*
25. Echocardiogram View Classification using Edge Filtered Scale-invariant Motion Features, *Ritwik Kumar, Fei Wang, David Beymer, Tanveer Syeda-Mahmood*
26. Shape Constrained Figure-Ground Segmentation and Tracking, *Zhaozheng Yin, Robert T. Collins*
27. Trajectory Parsing by Cluster Sampling in Spatio-temporal Graph, *Xiaobai Liu, Liang Lin, Song-Chun Zhu, Hai Jin*
28. Learning Visual Flows: A Lie Algebraic Approach, *Dahua Lin, Eric Grimson, John Fisher*
29. Vanishing Point Estimation by Self Similarity, *Hadas Kogan, Ron Maurer, Renato Keshet*
30. Active Learning for Large Multi-class Problems, *Prateek Jain, Ashish Kapoor*
31. What is the Spatial Extent of an Object?, *Jasper R. R. Uijlings, Arnold W. M. Smeulders, Remko J. H. Scha*
32. Pose Estimation for Category Specific Multiview Object Localization, *Mustafa Özuysal, Vincent Lepetit, Pascal Fua*
33. Non-Rigid 2D-3D Pose Estimation and 2D Image Segmentation, *Romeil Sandhu, Samuel Dambreville, Anthony Yezzi, Allen Tannenbaum*
34. Multi-Cue Onboard Pedestrian Detection, *Christian Wojek, Stefan Walk, Bernt Schiele*
35. HOP: Hierarchical Object Parsing, *Iasonas Kokkinos, Alan Yuille*
36. A Convex Relaxation Approach for Computing Minimal Partitions, *Thomas Pock, Antonin Chambolle, Daniel Cremers, Horst Bischof*
37. Global Connectivity Potentials for Random Field Models, *Sebastian Nowozin, Christoph H. Lampert*
38. Symmetry Integrated Region-based Image Segmentation, *Yu Sun, Bir Bhanu*
39. On the Set of Images Modulo Viewpoint and Contrast Changes, *Ganesh Sundaramoorthi, Peter Petersen, V. S. Varadarajan, Stefano Soatto*
40. Fast Multiple Shape Correspondence by Pre-Organizing Shape Instances, *Brent C. Munsell, Andrew Temlyakov, Song Wang*
41. Learning Shape Prior Models for Object Matching, *Tingting Jiang, Frederic Jurie, Cordelia Schmid*
42. Global Optimization for Alignment of Generalized Shapes, *Hongsheng Li, Tian Shen, Xiaolei Huang*
43. Unsupervised Learning for Graph Matching, *Marius Leordeanu, Martial Hebert*
44. Max-Margin Hidden Conditional Random Fields for Human Action Recognition, *Yang Wang, Greg Mori*
45. Rank Priors for Continuous Non-Linear Dimensionality Reduction, *Andreas Geiger, Raquel Urtasun, Trevor Darrell*
46. Unsupervised Maximum Margin Feature Selection with Manifold Regularization, *Bin Zhao, James Kwok, Fei Wang, Changshui Zhang*
47. Learning a Distance Metric from Multi-instance Multi-label Data, *Rong Jin, Shijun Wang, Zhi-Hua Zhou*

48. Alphabet SOUP: A Framework for Approximate Energy Minimization, *Stephen Gould, Fernando Amat, Daphne Koller*
49. An Instance Selection Approach to Multiple Instance Learning, *Zhouyu Fu, Antonio Robles-Kelly*
50. Learning from Ambiguously Labeled Images, *Timothee Cour, Benjamin Sapp, Chris Jordan, Ben Taskar*
51. Recognizing Linked Events: Searching the Space of Feasible Explanations, *Dima Damen, David Hogg*
52. Abnormal Crowd Behavior Detection using Social Force Model, *Ramin Mehran, Alexis Oayama, Mubarak Shah*
53. Recognition of Repetitive Sequential Human Activity, *Quanfu Fan, Russell Bobbitt, Zhai Yun, Akira Yanagwa, Sharath Pankanti, Arun Hampapur*

1710–1830 Statistical Methods & Learning (Sparkle East)

Chair – Svetlana Lazebnik *(Univ. of North Carolina at Chapel Hill)*

1. Learning To Detect Unseen Object Classes by Between-Class Attribute Transfer, *Christoph H. Lampert, Hannes Nickisch, Stefan Harmeling*
2. On Bias Correction for Geometric Parameter Estimation in Computer Vision, *Takayuki Okatani, Koichiro Deguchi*
3. Regularized Multi-Class Semi-Supervised Boosting, *Amir Saffari, Christian Leistner, Horst Bischof*
4. Contextual Classification with Functional Max-Margin Markov Networks, *Daniel Munoz, J. Andrew Bagnell, Nicolas Vandapel, Martial Hebert*

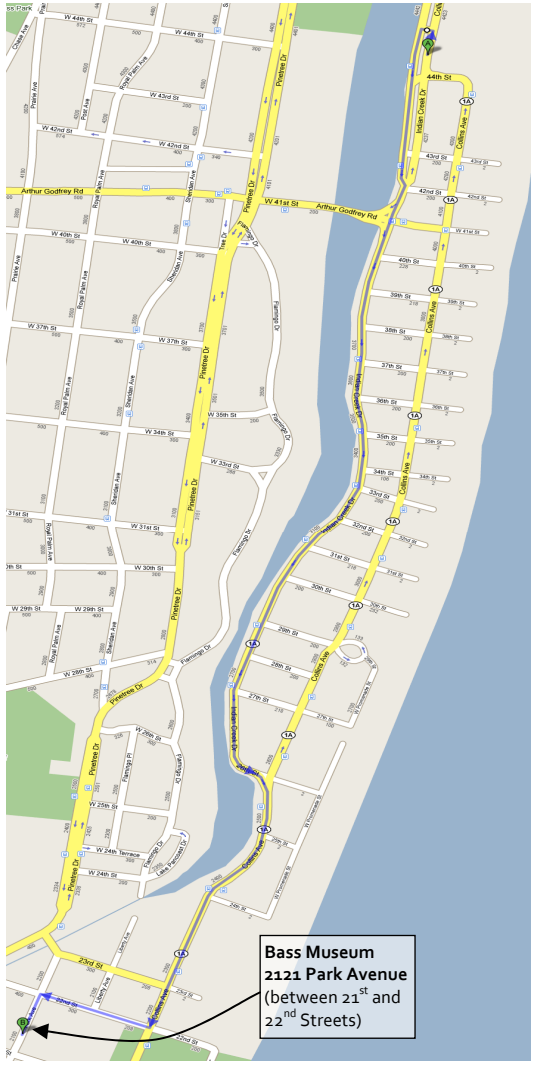
1710–1830 Tracking (Sparkle West)

Chair – Frank Dellaert *(Georgia Tech)*

1. Visual Tracking with Online Multiple Instance Learning, *Boris Babenko, Ming-Hsuan Yang, Serge Belongie*
2. Visual Tracking via Geometric Particle Filtering on the Affine Group with Optimal Importance functions, *Junghyun Kwon, Kyoung Mu Lee, Frank C. Park*
3. Memory-based Particle Filter for Face Pose Tracking Robust under Complex Dynamics, *Dan Mikami, Kazuhiro Otsuka, Junji Yamato*
4. Saliency-based Discriminant Tracking, *Vijay Mahadevan, Nuno Vasconcelos*

1830–2000 Reception (Bass Museum — bus transportation provided)

- See map on next page


Bass Museum
2121 Park Avenue
(between 21st and
22nd Streets)

Tuesday, June 23

0800–0900 Breakfast (Luster Gallerie)

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

0900–1020 Object Detection & Recognition (Sparkle East)

Chair – Tinne Tuytelaars *(Katholieke Universiteit Leuven)*

1. Pictorial Structures Revisited: People Detection and Articulated Pose Estimation, *Mykhaylo Andriluka, Stefan Roth, Bernt Schiele*
2. Class-Specific Hough Forests for Object Detection, *Juergen Gall, Victor Lempitsky*
3. Recognition using Regions, *Chunhui Gu, Joseph J. Lim, Pablo Arbeláez, Jitendra Malik*
4. Object Detection using a Max-Margin Hough Transform, *Subhransu Maji, Jitendra Malik*

0900–1020 Texture, Symmetry, & Shape (Sparkle West)

Chair – Kristin Dana (*Rudgers Univ.*)

1. Curved Glide-Reflection Symmetry Detection, *Seungkyu Lee, Yanxi Liu*
2. Reconstructing Sharply Folding Surfaces: A Convex Formulation, *Mathieu Salzmann, Pascal Fua*
3. Variational Layered Dynamic Textures, *Antoni B. Chan, Nuno Vasconcelos*
4. Retrographic Sensing for the Measurement of Surface Texture and Shape, *Micah K. Johnson, Edward H. Adelson*

1020–1030 Morning Break (Luster Gallerie)

1030–1100 Doctoral Spotlight (Sparkle East)

1030–1230 Demos (Splash 1-3)

- Real-Time O(1) Bilateral Filtering for Natural Video Conferencing, *Qingxiong Yang, Kar-Han Tan, Narendra Ahuja*
- Scalable Solutions for Creating an Interactive Video Experience, *Alex Holub, Andrei Makhanav, Pierre Moreels, Rui Yang*
- From Structure-from-Motion Point Clouds to Fast Location Recognition, *Arnold Irschara, Christopher Zach, Jan-Michael Frahm, Horst Bischof*
- Rate-Efficient, Real-Time CD Cover Recognition on a Camera-Phone, *Gabriel Takacs, Vijay Chandrasekhar, Sam Tsai, David Chen, Radek Grzeszczuk, Bernd Girod*
- A 3D Reconstruction Pipeline for Digital Preservation, *Alexandre Vrubel, Olga R. P. Bellon, Luciano Silva*
- FaceL: Facile Face Labeling and Average Of Synthetic Exact Filters Eye Detection, *David. S Bolme, J. Ross Beveridge*
- Memory-based Particle Filter for Head Pose Tracking Robust under Complex Dynamics, *Dan Mikami, Kazuhiro Otsuka, Junji Yamato*
- SURFTrac: Efficient Tracking and Continuous Object Recognition using Local Feature Descriptors, *Duy-Nguyen Ta, Wei Chao Chen, Natasha Gelfand, Kari Pulli*
- Overhead Imagery Research Data Set (OIRDS) – An Annotated Data Library & Tools to Aid in the Development of Computer Vision Algorithms, *Franklin Tanner, Brian Colder, Craig Pullen, David Heagy, Carsten Oertel, Phil Sallee, Beth Driver*

1030–1230 Exhibits (Splash 9-12)

- See Monday morning Exhibits

1030–1230 Poster Session 3 (Splash 9-16 & Ocean Promenade East/West)

1. Cooperative Mapping of Multiple PTZ Cameras in Automated Surveillance Systems, *Chung-Chen Chen, Yi Yao, Anis Drira, Andreas Koschan, Mongi Abidi*
2. Tour the World: Building a Web-scale Landmark Recognition Engine, *Yan-Tao Zheng, Ming Zhao, Yang Song, Hartwig Adam, Ulrich Buddemeier, Alessandro Bissacco, Fernando Brucher, Tat-Seng Chua, Hartmut Neven*

3. Flow Mosaicking: Real-time Pedestrian Counting without Scene-specific Learning, *Yang Cong, Haifeng Gong, Song-Chun Zhu, Yandong Tang*
4. VideoTrek: A Vision System for a Tag-along Robot, *Oleg Naroditsky, Zhiwei Zhu, Aveek Das, Supun Samarasekera, Taragay Oskiper, Rakesh Kumar*
5. A Projector-based Movable Hand-held Display System, *Man Chuen Leung, Kai Ki Lee, Kin Hong Wong, Michael Ming Yuen Chang*
6. Facial Deblur Inference to Improve Recognition of Blurred Faces, *Masashi Nishiyama, Hidenori Takeshima, Jamie Shotton, Tatsuo Kozakaya, Osamu Yamaguchi*
7. Coupled Spectral Regression for Matching Heterogeneous Faces, *Zhen Lei, Stan Z. Li*
8. Efficiently Training a Better Visual Detector with Sparse Eigenvectors, *Sakrapee Paisitkriangkrai, Chunhua Shen, Jian Zhang*
9. Observable Subspaces for 3D Human Motion Recovery, *Andrea Fossati, Mathieu Salzmann, Pascal Fua*
10. "Who are You?" — Learning Person Specific Classifiers from Video, *Josef Sivic, Mark Everingham, Andrew Zisserman*
11. A Revisit of Generative Model for Automatic Image Annotation using Markov Random Fields, *Yu Xiang, Xiangdong Zhou, Tat-Seng Chua, Chong-Wah Ngo*
12. Vocabulary Hierarchy Optimization for Effective and Transferable Retrieval, *Rongrong Ji, Xing Xie, Hongxun Yao, Wei-Ying Ma*
13. On the Burstiness of Visual Elements, *Hérve Jégou, Matthijs Douze, Cordelia Schmid*
14. Distance Transform Templates for Object Detection and Pose Estimation, *Stefan Holzer, Stefan Hinterstoisser, Slobodan Ilic, Nassir Navab*
15. Isometric Registration of Ambiguous and Partial Data, *Art Tevs, Martin Bokeloh, Michael Wand, Andreas Schilling, Hans-Peter Seidel*
16. Convexity and Bayesian Constrained Local Models, *Ulrich Paquet*
17. Multi-Object Tracking through Occlusions by Local Tracklets Filtering and Global Tracklets Association with Detection Responses, *Junliang Xing, Haizhou Ai, Shihong Lao*
18. Tracking of a Non-Rigid Object via Patch-based Dynamic Appearance Modeling and Adaptive Basin Hopping Monte Carlo Sampling, *Joonsuk Kwon, Kyoung Mu Lee*
19. Projective Least-Squares: Global Solutions with Local Optimization, *Carl Olsson, Fredrik Kahl, Richard Hartley*
20. A Minimal Parameterization of the Trifocal Tensor, *Klas Nordberg*
21. Visibility Constraints on Features of 3D Objects, *Ronen Basri, Pedro F. Felzenszwalb, Ross B. Girshick, David W. Jacobs, Caroline J. Klivans*
22. Keypoint Induced Distance Profiles for Visual Recognition, *Tat-Jun Chin, David Suter*
23. A Multi-View Probabilistic Model for 3D Object Classes, *Min Sun, Hao Su, Silvio Savarese, Fei-Fei Li*
24. Granularity-tunable Gradients Partition (GGP) Descriptors for Human Detection, *Yazhou Liu, Shiguang Shan, Wenchao Zhang, Xilin Chen, Wen Gao*
25. Unsupervised Feature Optimization (UFO): Simultaneous Selection of Multiple Features with their Detection Parameters, *Leonid Karlinsky, Michael Dinerstein, Shimon Ullman*
26. An Empirical Study of Context in Object Detection, *Santosh Kumar Divvala, Derek Hoiem, James H. Hays, Alexei A. Efros, Martial Hebert*
27. Appearance-based Keypoint Clustering, *Francisco J. Estrada, Pascal Fua, Vincent Lepetit, Sabine Süsstrunk*
28. Robust Unsupervised Segmentation of Degraded Document Images with Topic Models, *Timothy J. Burns, Jason J. Corso*
29. Shape Priors and Discrete MRFs for Knowledge-based Segmentation, *Ahmed Besbes, Nikos Komodakis, Georg Langs, Nikos Paragios*
30. P-Brush: Continuous Valued MRFs with Normed Pairwise Distributions for Image Segmentation, *Dheeraj Singaraju, Leo Grady, René Vidal*
31. Predicting High Resolution Image Edges with a Generic, Adaptive, 3-D Vehicle Model, *Matthew J. Leotta, Joseph L. Mundy*
32. Nonrigid Shape Recovery by Gaussian Process Regression, *Jianke Zhu, Steven C. H. Hoi, Michael R. Lyu*
33. 3D Morphable Face Models Revisited, *Ankur Patel, William A. P. Smith*

34. Shape Band: A Deformable Object Detection Approach, *Xiang Bai, Quannan Li, Longin Jan Latecki, Wenyu Liu, Zhuowen Tu*
35. Robust Object Detection Using Marginal Space Learning and Ranking-Based Multi-Detector Aggregation: Application to Left Ventricle Detection in 2D MRI Images, *Yefeng Zheng, Xiaoguang Lu, Bogdan Georgescu, Arne Littmann, Edgar Mueller, Dorin Comaniciu*
36. Layered Graph Matching by Composite Cluster Sampling with Collaborative and Competitive Interactions, *Liang Lin, Kun Zeng, Xiaobai Liu, Song-Chun Zhu*
37. A Min-Max Framework of Cascaded Classifier with Multiple Instance Learning for Computer Aided Diagnosis, *Dijia Wu, Jinbo Bi, Kim Boyer*
38. Building Text Features for Object Image Classification, *Gang Wang, Derek Hoiem, David Forsyth*
39. Domain Transfer SVM for Video Concept Detection, *Lixin Duan, Ivor W. Tsang, Dong Xu, Stephen J. Maybank*
40. Minimizing Sparse Higher Order Energy Functions of Discrete Variables, *Carsten Rother, Pushmeet Kohli, Wei Feng, Jiaya Jia*
41. Label Diagnosis through Self Tuning for Web Image Search, *Jun Wang, Yu-Gang Jiang, Shih-Fu Chang*
42. Learning IMED via Shift-Invariant Transformation, *Bing Sun, Jufu Feng, Liwei Wang*
43. Markov Chain Monte Carlo Combined with Deterministic Methods for Markov Random Field Optimization, *Wonsik Kim, Kyoung Mu Lee*
44. Stereographic Rectification of Omnidirectional Stereo Pairs, *Jan Heller, Tomáš Pajdla*
45. Manhattan-world Stereo, *Yasutaka Furukawa, Brian Curless, Steven M. Seitz, Richard Szeliski*
46. Towards High-resolution Large-scale Multi-view Stereo, *Vu Hoang Hiep, Renaud Keriven, Patrick Labatut, Jean-Philippe Pons*
47. Visual Loop Closing using Multi-Resolution SIFT Grids in Metric-Topological SLAM, *Vivek Pradeep, Gérard Medioni, James Weiland*
48. Anomaly Detection in Extremely Crowded Scenes using Spatio-Temporal Motion Pattern Models, *Louis Kratz, Ko Nishino*
49. Dense Saliency-based Spatiotemporal Feature Points for Action Recognition, *Konstantinos Rapantzikos, Yannis Avrithis, Stefanos Kollias*
50. Monitoring, Recognizing and Discovering Social Networks, *Ting Yu, Ser-Nam Lim, Kedar Patwardhan, Nils Krahnstoever*
51. Recognizing Human Group Activities by Localized Causalities, *Bingbing Ni, Shuicheng Yan, Ashraf Kassim*
52. Human Motion Synthesis from 3D Video, *Peng Huang, Adrian Hilton, Jonathan Starck*
53. Distributed Multi-Target Tracking In A Self-Configuring Camera Network, *Cristian Soto, Bi Song, Amit K. Roy-Chowdhury*
54. Active Stereo Tracking of Multiple Free-Moving Targets, *Luis Perdigoto, Joao P. Barreto, Rui Caseiro, Helder Araujo*

1230–1400 Lunch on your own

1400–1500 Face Recognition (Sparkle East)

Chair – Ming-Hsuan Yang *(Univ. of California at Merced)*

1. Implicit Elastic Matching with Random Projections for Pose-Variant Face Recognition, *John Wright, Gang Hua*
2. Joint and Implicit Registration for Face Recognition, *Peng Li, Simon J. D. Prince*
3. A Compressive Sensing Approach for Expression-Invariant Face Recognition, *Pradeep Nagesh, Baoxin Li*

1400–1440 SFM & Geometry (Sparkle West)

Chair – Ramesh Raskar *(Massachusetts Institute of Technology)*

1. What is a Camera?, *Jean Ponce*
2. In Defense of Orthonormality Constraints for Nonrigid Structure from Motion, *Ijaz Akhter, Yaser Sheikh, Sohaib Khan*

1500–1510 Afternoon Break (Luster Gallerie)

1510–1700 Demos (Splash 1-3)

- See Tuesday morning Demos

1510–1710 Exhibits (Splash 9-12)

- See Monday morning Exhibits

1510–1700 Poster Session 4 (Splash 9-16 & Ocean Promenade East/West)

1. Multiple View Image Denoising, *Li Zhang, Sundeep Vaddadi, Hailin Jin, Shree K. Nayar*
2. Image Deblurring and Denoising using Color Priors, *Neel Joshi, C. Lawrence Zitnick, Richard Szeliski, David J. Kriegman*
3. Image Deblurring for Less Intrusive Iris Capture, *Xinyu Huang, Liu Ren, Ruigang Yang*
4. High-quality Curvelet-based Motion Deblurring using an Image Pair, *Jian-Feng Cai, Hui Ji, Chaoqiang Liu, Zuowei Shen*
5. Learning Real-Time MRF Inference for Image Denoising, *Adrian Barbu*
6. Learning Rotational Features for Filament Detection, *Germán González, François Fleuret, Pascal Fua*
7. Histogram-based Interest Point Detectors, *Wei-Ting Lee, Hwann-Tzong Chen*
8. Frequency-tuned Salient Region Detection, *Radhakrishna Achanta, Sheila Hemami, Francisco J. Estrada, Sabine Süsstrunk*
9. Learning Invariant Features Through Topographic Filter Maps, *Koray Kavukcuoglu, Marc' Aurelio Ranzato, Rob Fergus, Yann LeCun*
10. Face Verification and Identification using Facial Trait Code, *Ping-Han Lee, Gee-Sern Hsu, Yi-Ping Hung*
11. Enhanced Pictorial Structures for Precise Eye Localization Under Uncontrolled Conditions, *Xiaoyang Tan, Fengyi Song, Zhi-Hua Zhou, Songcan Chen*
12. Textural Hausdorff Distance for Wider-Range Tolerance to Pose Variation and Misalignment in 2D Face Recognition, *Sanqiang Zhao, Yongsheng Gao*
13. Learning Based Automatic Face Annotation for Arbitrary Poses and Expressions from Frontal Images Only, *Akshay Asthana, Roland Goecke, Novi Quadrianto, Tom Gedeon*
14. Multi-Label Sparse Coding for Automatic Image Annotation, *Changhu Wang, Shuicheng Yan, Lei Zhang, Hong-Jiang Zhang*
15. View-Invariant Dynamic Texture Recognition using a Bag of Dynamical Systems, *Avinash Ravichandran, Rizwan Chaudhry, René Vidal*
16. Efficient Multi-label Classification with Hypergraph Regularization, *Gang Chen, Jianwen Zhang, Fei Wang, Changshui Zhang, Yuli Gao*
17. Localized Content-Based Image Retrieval Through Evidence Region Identification, *Wu-Jun Li, Dit-Yan Yeung*
18. Dense 3D Motion Capture for Human Faces, *Yasutaka Furukawa, Jean Ponce*
19. Contextualizing Histogram, *Bingbing Ni, Shuicheng Yan, Ashraf Kassim*

20. The Geometry of 2D Image Signals, *Lennart Wietzke, Gerald Sommer, Oliver Fleischmann*
21. Random Walks on Graphs to Model Saliency in Images, *Viswanath Gopalakrishnan, Yiqun Hu, Deepu Rajan*
22. 3D Pose Estimation and Segmentation using Specular Cues, *Ju Yong Chang, Ramesh Raskar, Amit Agrawal*
23. On Compositional Image Alignment, with an Application to Active Appearance Models, *Brian Amberg, Andrew Blake, Thomas Vetter*
24. A Similarity Measure Between Vector Sequences with Application to Handwritten Word Image Retrieval, *José Rodríguez-Serrano, Florent Perronnin, Josep Lladós, Gemma Sánchez*
25. Adaptive Image and Video Retargeting Based on Fourier Analysis, *Jun-Seong Kim, Jin-Hwan Kim, Chang-Su Kim*
26. Video Object Segmentation by Hypergraph Cut, *Yuchi Huang, Qingshan Liu, Dimitris Metaxas*
27. Motion Capture Using Joint Skeleton Tracking and Surface Estimation, *Juergen Gall, Carsten Stoll, Edilson de Aguiar, Christian Theobalt, Bodo Rosenhahn, Hans-Peter Seidel*
28. Discrete Tracking of Parametrized Curves, *Tim Hauke Heibel, Ben Glocker, Martin Groher, Nikos Paragios, Nikos Komodakis, Nassir Navab*
29. Efficient Kernels for Identifying Unbounded-Order Spatial Features, *Yimeng Zhang, Tsuhan Chen*
30. Modeling Images as Mixtures of Reference Images, *Florent Perronnin, Yan Liu*
31. Describing Objects by their Attributes, *Ali Farhadi, Ian Endres, Derek Hoiem, David Forsyth*
32. Adaptive Contour Features in Oriented Granular Space for Human Detection and Segmentation, *Wei Gao, Haizhou Ai, Shihong Lao*
33. Linear Spatial Pyramid Matching Using Sparse Coding for Image Classification, *Jianchao Yang, Kai Yu, Yihong Gong, Thomas S. Huang*
34. Sigma Set: A Small Second Order Statistical Region Descriptor, *Xiaopeng Hong, Hong Chang, Shiguang Shan, Xilin Chen, Wen Gao*
35. Efficient Scale Space Auto-Context for Image Segmentation and Labeling, *Jiayan Jiang, Zhuowen Tu*
36. Fast Mean Shift by Compact Density Representation, *Daniel Freedman, Pavel Kisilev*
37. A Perceptually Motivated Online Benchmark for Image Matting, *Christoph Rhemann, Carsten Rother, Jue Wang, Margrit Gelautz, Pushmeet Kohli, Pamela Rott*
38. 3D Reconstruction of Curved Objects from Single 2D Line Drawings, *Yingze Wang, Yu Chen, Jianzhuang Liu, Xiaoou Tang*
39. Capturing 3D Stretchable Surfaces from Single Images in Closed Form, *Francesc Moreno-Noguer, Mathieu Salzmann, Vincent Lepetit, Pascal Fua*
40. Photometric Stereo and Weather Estimation Using Internet Images, *Li Shen, Ping Tan*
41. Continuous Ratio Optimization via Convex Relaxation with Applications to Multiview 3D Reconstruction, *Kalin Kolev, Daniel Cremers*
42. Depth from Sliding Projections, *Chris Hermans, Yannick Francken, Tom Cuypers, Philippe Bekaert*
43. Nonnegative Matrix Factorization with Earth Mover's Distance Metric, *Roman Sandler, Michael Lindenbaum*
44. Blind Separation of Superimposed Images with Unknown Motions, *Kun Gai, Zhenwei Shi, Changshui Zhang*
45. Holistic Context Modeling using Semantic Co-occurrences, *Nikhil Rasiwasia, Nuno Vasconcelos*
46. Intrinsic Mean Shift for Clustering on Stiefel and Grassmann Manifolds, *Hasan Ertan Çetingul, René Vidal*
47. Simultaneous Image Classification and Annotation, *Chong Wang, David Blei, Fei-Fei Li*
48. Continuous Maximal Flows and Wulff Shapes: Application to MRFs, *Christopher Zach, Marc Niethammer, Jan-Michael Frahm*
49. An Implicit Markov Random Field Model for the Multi-scale Oriented Representations of Natural Images, *Siwei Lyu*
50. Stochastic Gradient Kernel Density Mode-Seeking, *Xiao-Tong Yuan, Stan Z. Li*
51. Histograms of Oriented Optical Flow and Binet-Cauchy Kernels on Nonlinear Dynamical Systems for the Recognition of Human Actions, *Rizwan Chaudhry, Avinash Ravichandran, Gregory Hager, René Vidal*

52. Learning Semantic Scene Models by Object Classification and Trajectory Clustering, *Tianzhu Zhang, Hanqing Lu, Stan Z. Li*
53. Recognising Action as Clouds of Space-Time Interest Points, *Matteo Bregonzio, Shaogang Gong, Tao Xiang*

1700–1835 Paper Awards (Sparkle East)

Chair – Michael Black *(Brown Univ.)*

1. **Best Paper:** Single Image Haze Removal Using Dark Channel Prior, *Kaiming He, Jian Sun, Xiaoou Tang*
2. **Best Paper – Honorable Mention:** Understanding and Evaluating Blind Deconvolution Algorithms, *Anat Levin, Yair Weiss, Fredo Durand, William T. Freeman*
3. **Best Student Paper:** Nonparametric Scene Parsing: Label Transfer via Dense Scene Alignment, *Ce Liu, Jenny Yuen, Antonio Torralba*
4. **Best Student Paper – Honorable Mention:** A Tensor-Based Algorithm for High-Order Graph Matching, *Olivier Duchenne, Francis Bach, Inso Kweon, Jean Ponce*

Presentation of Awards & CVPR 2009 Report

1835–2000 Reception (Ocean Lawn)

Bar sponsored by Point Grey

2000–2100 PAMI TC Meeting (Sparkle East)

Wednesday, June 24

0800–0900 Breakfast (Luster Gallerie)

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

0900–1020 Video Analysis (Sparkle East)

Chair – Anthony Hoogs *(Kitware, Inc.)*

1. Multi-Camera Activity Correlation Analysis, *Chen Change Loy, Tao Xiang, Shaogang Gong*
2. Recognizing Realistic Actions from Videos "in the Wild", *Jingen Liu, Jiebo Luo, Mubarak Shah*
3. Hierarchical Spatio-Temporal Context Modeling for Action Recognition, *Ju Sun, Xiao Wu, Shuicheng Yan, Loong-Fah Cheong, Tat-Seng Chua, Jintao Li*
4. Understanding Videos, Constructing Plots—Learning a Visually Grounded Storyline Model from Annotated Videos, *Abhinav Gupta, Praveen Srinivasan, Jianbo Shi, Larry S. Davis*

0900–1020 Segmentation (Sparkle West)

Chair – Alexei (Alyosha) Efros *(Carnegie Mellon)*

1. Multiphase Geometric Couplings for the Segmentation of Neural Processes, *Amelio Vazquez Reina, Eric Miller, Hanspeter Pfister*
2. Half-integrality Based Algorithms for Cosegmentation of Images, *Lopamudra Mukherjee, Vikas Singh, Charles R. Dyer*
3. Towards Total Scene Understanding: Classification, Annotation and Segmentation in an Automatic Framework, *Li-Jia Li, Richard Socher, Fei-Fei Li*
4. Stel Component Analysis: : Modeling Spatial Correlations in Image Class Structure, *Nebojsa Jojic, Alessandro Perina, Marco Cristani, Vittorio Murino, Brendan Frey*

1020–1030 Morning Break (Luster Gallerie)

1030–1100 Doctoral Spotlight (Sparkle East)

1030–1230 Demos (Splash 1-3)

- To be decided

1030–1230 Exhibits (Splash 9-12)

- See Monday morning Exhibits

1030–1230 Poster Session 5 (Splash 9-16 & Ocean Promenade East/West)

1. Geometric and Probabilistic Image Dissimilarity Measures for Common Field of View Detection, *Marcel Brückner, Ferid Bajramovic, Joachim Denzler*
2. Single-Image Optical Center Estimation from Vignetting and Tangential Gradient Symmetry, *Yuanjie Zheng, Chandra Kambhamettu, Stephen Lin*
3. Coded Exposure Deblurring: Optimized Codes for PSF Estimation and Invertibility, *Amit Agrawal, Yi Xu*
4. Image Hallucination with Feature Enhancement, *Zhiwei Xiong, Xiaoyan Sun, Feng Wu*
5. A Projector-Camera Setup for Geometry-Invariant Frequency Demultiplexing, *Daniel A. Vaquero, Ramesh Raskar, Rogerio S. Feris, Matthew Turk*
6. Nonparametric Discriminant HMM and Application to Facial Expression Recognition, *Lifeng Shang, Kwok-Ping Chan*
7. Automatic Facial Landmark Labeling with Minimal Supervision, *Yan Tong, Xiaoming Liu, Frederick W. Wheeler, Peter Tu*
8. Average of Synthetic Exact Filters, *David S. Bolme, Bruce A. Draper, J. Ross Beveridge*
9. Beyond the Graphs: Semi-parametric Semi-supervised Discriminant Analysis, *Fei Wang, Xin Wang, Tao Li*
10. Continuous Depth Estimation for Multi-view Stereo, *Yebin Liu, Xun Cao, Qionghai Dai, Wenli Xu*
11. Curvature and Singularity Driven Diffusion for Oriented Pattern Enhancement with Singular Points, *Qijun Zhao, Lei Zhang, David Zhang, Wenyi Huang, Jian Bai*

12. Geometric Reasoning for Single Image Structure Recovery, *David C. Lee, Martial Hebert, Takeo Kanade*
13. Linear Stratified Approach for 3D Modeling and Calibration using Full Geometric Constraints, *Jae-Hean Kim*
14. A Graph-based Approach to Skin Mole Matching Incorporating Template-Normalized Coordinates, *Hengameh Mirzaalian, Ghassan Hamarneh, Tim K. Lee*
15. Harris Corners in the Real World: A Principled Selection Criterion for Interest Points Based on Ecological Statistics, *Neil D. B. Bruce, Pierre Kornprobst*
16. Classification of Tensors and Fiber Tracts Using Mercer-Kernels Encoding Soft Probabilistic Spatial and Diffusion Information, *Radhouène Neji, Nikos Paragios, Gilles Fleury, Jean-Philippe Thiran, Georg Langs*
17. Noninvasive Volumetric Imaging of Cardiac Electrophysiology, *Linwei Wang, Heye Zhang, Ken C. L. Wong, Huafeng Liu, Pengcheng Shi*
18. Wavelet Energy Map: A Robust Support for Multi-modal Registration of Medical Images, *Olivier Pauly, Nicolas Padoy, Holger Poppert, Lorena Esposito, Nassir Navab*
19. Compensation of Motion Artifacts in MRI via Graph-Based Optimization, *Tung-Ying Lee, Hong-Ren Su, Shang-Hong Lai, Ti-Chiun Chang*
20. Nonrigid Registration Combining Global and Local Statistics, *Zhao Yi, Stefano Soatto*
21. An Efficient Stochastic Approach to Groupwise Non-rigid Image Registration, *Kirill A. Sidorov, Stephen Richmond, David Marshall*
22. Multi-view 3D Human Pose Estimation Combining Single-frame Recovery, Temporal Integration and Model Adaptation, *Michael Hofmann, Dariu M. Gavrila*
23. Bias Reduction for Stereo based Motion Estimation with Applications to Large Scale Visual Odometry, *Gijs Dubbelman, Fans C. A. Groen*
24. Efficient Image Alignment using Linear Appearance Models, *Jose Gonzalez-Mora, Nicolas Guil, Emilio L. Zapata, Fernando de la Torre*
25. Discriminative Structure Learning of Hierarchical Representations for Object Detection, *Paul Schnitzspan, Mario Fritz, Stefan Roth, Bernt Schiele*
26. Fast Human Detection in Crowded Scenes by Contour Integration and Local Shape Estimation, *Csaba Beleznai, Horst Bischof*
27. Shape Discovery from Unlabeled Image Collections, *Yong Jae Lee, Kristen Grauman*
28. What's It Going to Cost You?: Predicting Effort vs. Informativeness for Multi-Label Image Annotations, *Sudheendra Vijayanarasimhan, Kristen Grauman*
29. Contextual Decomposition of Multi-Label Images, *Teng Li, Tao Mei, Shuicheng Yan, In-So Kweon, Chilwoo Lee*
30. Disambiguating the Recognition of 3D Objects, *Gutemberg Guerra-Filho*
31. Tubular Anisotropy for 2D Vessel Segmentation, *Fethallah Benmansour, Laurent D. Cohen, Max W. K. Law, Albert C. S. Chung*
32. From Contours to Regions: An Empirical Evaluation, *Pablo Arbeláez, Michael Maire, Charless Fowlkes, Jitendra Malik*
33. Angular Embedding: from Jarring Intensity Differences to Perceived Luminance, *Stella X. Yu*
34. Moving Cast Shadow Detection using Physics-based Features, *Jia-Bin Huang, Chu-Song Chen*
35. Planar Orientation from Blur Gradients in a Single Image, *Scott McCloskey, Michael Langer*
36. Recovering Specular Surfaces Using Curved Line Images, *Yuanyuan Ding, Jingyi Yu, Peter Sturm*
37. Distributed Volumetric Scene Geometry Reconstruction With a Network of Distributed Smart Cameras, *Shubao Liu, Kongbin Kang, Jean-Philippe Tarel, David B. Cooper*
38. Fourier Analysis and Gabor Filtering for Texture Analysis and Local Reconstruction of General Shapes, *Fabio Galasso, Joan Lasenby*
39. Enforcing Integrability by Error Correction using ℓ_1-minimization, *Dikpal Reddy, Amit Agrawal, Rama Chellappa*
40. A Family of Contextual Measures of Similarity between Distributions with Application to Image Retrieval, *Florent Perronnin, Yan Liu, Jean-Michel Renders*
41. Shape of Gaussians as Feature Descriptors, *Liyu Gong, Tianjiang Wang, Fang Liu*
42. Multi-Class Active Learning for Image Classification, *Ajay J. Joshi, Fatih Porikli, Nikolaos Papanikolopoulos*

43. An Empirical Bayes Approach to Contextual Region Classification, *Svetlana Lazebnik, Maxim Raginsky*
44. Super-Resolution via Recapture and Bayesian Effect Modeling, *Neil Toronto, Bryan S. Morse, Kevin Seppi, Dan Ventura*
45. Ensemble Manifold Regularization, *Bo Geng, Dacheng Tao, Chao Xu, Linjun Yang, Xian-Sheng Hua*
46. Structured Output-Associative Regression, *Liefeng Bo, Cristian Sminchisescu*
47. Error Propagations for Local Bundle Adjustment, *Alexandre Eudes, Maxime Lhuillier*
48. Pose Estimation with Radial Distortion and Unknown Focal Length, *Klas Josephson, Martin Byröd*
49. Linear Embeddings in Non-Rigid Structure From Motion, *Vincent Rabaud, Serge Belongie*
50. Locally Time-Invariant Models of Human Activities using Trajectories on the Grassmannian, *Pavan Turaga, Rama Chellappa*
51. Discriminative Subvolume Search for Efficient Action Detection, *Junsong Yuan, Zicheng Liu, Ying Wu*
52. Learning Multi-modal Densities on Discriminative Temporal Interaction Manifold for Group Activity Recognition, *Ruonan Li, Rama Chellappa, Shaohua Kevin Zhou*
53. Abnormal Events Detection Based on Spatio-Temporal Co-occurences, *Yannick Benezeth, Pierre-Marc Jodoin, Venkatesh Saligrama, Christophe Rosenberger*

1230–1400 Lunch on your own

1400–1500 Matching & Alignment (Sparkle East)

Chair – Fei-Fei Li *(Princeton Univ.)*

1. A Robust Shape Model for Multi-view Car Alignment, *Yan Li, Leon Gu, Takeo Kanade*
2. Linear Solution to Scale and Rotation Invariant Object Matching, *Hao Jiang, Stella X. Yu*
3. Dimension-Free Affine Shape Matching Through Subspace Invariance, *Zhaozhong Wang, Han Xiao*

1400–1500 Features & Medical Image Analysis (Sparkle West)

Chair – Gregory Hager *(Johns Hopkins Univ.)*

1. Automatic Fetal Face Detection From Ultrasound Volumes Via Learning 3D and 2D Information, *Shaolei Feng, S. Kevin Zhou, Sara Good, Dorin Comaniciu*
2. A Nonparametric Riemannian Framework for Processing High Angular Resolution Diffusion Images (HARDI), *Alvina Goh, Christophe Lenglet, Paul M. Thompson, René Vidal*
3. CHoG: Compressed Histogram of Gradients—A Low Bit-Rate Feature Descriptor, *Vijay Chandrasekhar, Gabriel Takacs, David Chen, Sam Tsai, Radek Grzeszczuk, Bernd Girod*

1500–1510 Afternoon Break (Luster Gallerie)

1510–1710 Demos (Splash 1-3)

- To be decided

1510–1710 Exhibits (Splash 9-12)

- See Monday morning Exhibits

1510–1710 Poster Session 6 (Splash 9-16 & Ocean Promenade East/West)

1. Resolution-Invariant Image Representation and Its Applications, *Jinjun Wang, Shenghuo Zhu, Yihong Gong*
2. Interval HSV: Extracting Ink Annotations, *John C. Femiani, Anshuman Razdan*
3. Catadioptric Projectors, *Yuanyuan Ding, Jing Xiao, Kar-Han Tan, Jingyi Yu*
4. Capturing Multiple Illumination Conditions using Time and Color Multiplexing, *Bert De Decker, Jan Kautz, Tom Mertens, Philippe Bekaert*
5. Removing Partial Blur in a Single Image, *Shengyang Dai, Ying Wu*
6. Uncalibrated Synthetic Aperture for Defocus Control, *Natsumi Kusumoto, Shinsaku Hiura, Kosuke Sato*
7. Optimal Single Image Capture for Motion Deblurring, *Amit Agrawal, Ramesh Raskar*
8. Learning Signs from Subtitles: A Weakly Supervised Approach to Sign Language Recognition, *Helen Cooper, Richard Bowden*
9. Expression-Insensitive 3D Face Recognition using Sparse Representation, *Xiaoxing Li, Tao Jia, Richard (Hao) Zhang*
10. Automated Extraction of Signs from Continuous Sign Language Sentences using Iterated Conditional Modes, *Sunita Nayak, Sudeep Sarkar, Barbara Loeding*
11. How far can you get with a modern face recognition test set using only simple features?, *Nicolas Pinto, James J. DiCarlo, David D. Cox*
12. From Structure-from-Motion Point Clouds to Fast Location Recognition, *Arnold Irschara, Christopher Zach, Jan-Michael Frahm, Horst Bischof*
13. Imbalanced RankBoost for Efficiently Ranking Large-Scale Image/Video Collections, *Michele Merler, Rong Yan, John R. Smith*
14. Learning Query-dependent Prefilters for Scalable Image Retrieval, *Lorenzo Torresani, Martin Szummer, Andrew Fitzgibbon*
15. A Robust Approach for Automatic Registration of Aerial Images with Untextured Aerial LiDAR Data, *Lu Wang, Ulrich Neumann*

16. A Novel Feature Descriptor Invariant to Complex Brightness Changes, *Feng Tang, Suk Hwan Lim, Nelson L. Chang, Hai Tao*
17. Automatic Registration of LIDAR and Optical Images of Urban Scenes, *Andrew Mastin, Jeremy Kepner, John Fisher III*
18. Learning to Track with Multiple Observers, *Björn Stenger, Thomas Woodley, Roberto Cipolla*
19. Switching Gaussian Process Dynamic Models for Simultaneous Composite Motion Tracking and Recognition, *Jixu Chen, Minyoung Kim, Yu Wang, Qiang Ji*
20. A Distribution-Based Approach to Tracking Points in Velocity Vector Fields, *Liefei Xu, H. Quynh Dinh, Eugene Zhang, Zhongzang Lin, Robert S. Laramee*
21. Motion Pattern Interpretation and Detection for Tracking Moving Vehicles in Airborne Videos, *Qian Yu, Gérard Medioni*
22. Dual Distributions of Multilinear Geometric Entities, *Sami S. Brandt*
23. A 3D Reconstruction Pipeline for Digital Preservation, *Alexandre Vrubel, Olga R. P. Bellon, Luciano Silva*
24. Efficient Reduction of L-infinity Geometry Problems, *Hongdong Li*
25. Fast Car Detection Using Image Strip Features, *Wei Zheng, Luhong Liang*
26. Building a Database of 3D Scenes from User Annotations, *Bryan C. Russell, Antonio Torralba*
27. Image Categorization by Learning with Context and Consistency, *Zhiwu Lu, Horace H. S. Ip*
28. Classifier Grids for Robust Adaptive Object Detection, *Peter M. Roth, Sabine Sternig, Helmut Grabner, Horst Bischof*
29. Stacks of Convolutional Restricted Boltzmann Machines for Shift-Invariant Feature Learning, *Mohammad Norouzi, Mani Ranjbar, Greg Mori*
30. Unsupervised Learning of Hierarchical Spatial Structures In Images, *Devi Parikh, C. Lawrence Zitnick, Tsuhan Chen*
31. Optimal Scanning for Faster Object Detection, *Nicholas J. Butko, Javier R. Movellan*
32. A Streaming Framework for Seamless Building Reconstruction from Large-Scale Aerial LiDAR Data, *Qian-Yi Zhou, Ulrich Neumann*
33. On Edge Detection on Surfaces, *Michael Kolomenkin, Ilan Shimshoni, Ayellet Tal*
34. Automatic Reconstruction of Cities from Remote Sensor Data, *Charalambos Poullis, Suya You*
35. D - Clutter: Building Object Model Library from Unsupervised Segmentation of Cluttered Scenes, *Gowri Somanath, Rohith MV, Dimitris Metaxas, Chandra Kambhamettu*
36. Sparse Subspace Clustering, *Ehsan Elhamifar, René Vidal*
37. Global Active Contour-based Image Segmentation via Probability Alignment, *Andriy Myronenko, Xubo Song*
38. Material Classification using BRDF Slices, *Oliver Wang, Prabath Gunawardane, Steven Scher, James Davis*
39. Epitomized Priors for Multi-labeling Problems, *Jonathan Warrell, Simon J. D. Prince, Alastair P. Moore*
40. Symmetric Two Dimensional Linear Discriminant Analysis (2DLDA), *Dijun Luo, Chris Ding, Heng Huang*
41. A Multiscale Hybrid Model Exploiting Heterogeneous Contextual Relationships for Image Segmentation, *Lei Zhang, Qiang Ji*
42. Let the Kernel Figure it Out; Principled Learning of Pre-processing for Kernel Classifiers, *Peter Vincent Gehler, Sebastian Nowozin*
43. Co-training with Noisy Perceptual Observations, *C. Mario Christhoudias, Raquel Urtasun, Ashish Kapoor, Trevor Darrell*
44. Shared Kernel Information Embedding for Discriminative Inference, *Leonid Sigal, Roland Memisevic, David J. Fleet*
45. Nonlinear Nonnegative Component Analysis, *Stefanos Zafeiriou, Maria Petrou*
46. Fast Normalized Cut with Linear Constraints, *Linli Xu, Wenye Li, Dale Schuurmans*
47. Randomized Structure from Motion Based on Atomic 3D Models from Camera Triplets, *Michal Havlena, Akihiko Torii, Jan Knopp, Tomáš Pajdla*

48. Towards Geographical Referencing of Monocular SLAM Reconstruction Using 3D City Models: Application to Real-Time Accurate Vision-Based Localization, *Pierre Lothe, Steve Bourgeois, Fabien Dekeyser, Eric Royer, Michel Dhome*
49. Trajectory Reconstruction for Affine Structure-from-Motion by Global and Local Constraints, *Hanno Ackermann, Bodo Rosenhahn*
50. Factorization for Non-Rigid and Articulated Structure using Metric Projections, *Marco Paladini, Alessio Del Bue, Marko Stošić, Marija Dodig, João Xavier, Lourdes Agapito*
51. Piecewise Planar City 3D Modeling from Street View Panoramic Sequences, *Branislav Mičušík, Jana Košecká*
52. Marked Point Processes for Crowd Counting, *Weina Ge, Robert T. Collins*
53. Observe Locally, Infer Globally: a Space-Time MRF for Detecting Abnormal Activities with Incremental Updates, *Jaechul Kim, Kristen Grauman*
54. Actions in context, *Marcin Marszałek, Ivan Laptev, Cordelia Schmid*

1710–1830 Tracking & Learning (Sparkle East)

Chair – Fatih Porikli *(Mitsubishi Electric Research Labs)*

1. SURFTrac: Efficient Tracking and Continuous Object Recognition using Local Feature Descriptors, *Duy-Nguyen Ta, Wei-Chao Chen, Natasha Gelfand, Kari Pulli*
2. Real Time Learning of Accurate Patch Rectification, *Stefan Hinterstoisser, Oliver Kutter, Nassir Navab, Pascal Fua, Vincent Lepetit*
3. Learning to Associate: HybridBoosted Multi-Target Tracker for Crowded Scene, *Yuan Li, Chang Huang, Ram Nevatia*
4. Learning Sign Language by Watching TV (Using Weakly Aligned Subtitles), *Patrick Buehler, Mark Everingham, Andrew Zisserman*

1710–1830 Radiometry & Optimization Techniques (Sparkle West)

Chair – Daniel Cremers *(Univ. of Bonn)*

1. (De)Focusing on Global Light Transport for Active Scene Recovery, *Mohit Gupta, Yuandong Tian, Srinivasa G. Narasimhan, Li Zhang*
2. Beyond Pairwise Energies: Efficient Optimization for Higher-order MRFs, *Nikos Komodakis, Nikos Paragios*
3. A Projective Framework for Radiometric Image Analysis, *Ping Tan, Todd Zickler*
4. Higher-Order Clique Reduction in Binary Graph Cut, *Hiroshi Ishikaw*

Thursday, June 25

General Information

0800–1900 Registration (Swirl)

0800–1900 Computer Room (Trickle)

Projector-Camera Systems (PROCAMS)

Location: Splash 15-16

Schedule:

0800 Breakfast

0830 Welcome message

S1: Keynote Session (0840–0925)

0840 **Keynote:** TBD

S2: Acquisition 1 (0925–1005)

0925 Synchronization and Rolling Shutter Compensation for Consumer Video Camera Arrays, *Derek Bradley, Bradley Atcheson, Ivo Ihrke, Wolfgang Heidrich*

0945 Illustrating Motion through DLP Photography, *Sanjeev J. Koppal, Srinivasa G. Narasimhan*

1005 Morning Break

S3: Poster Fast Forward (1030–1050)

S4: Applications (1050–1150)

1050 A Projector-Camera System for Creating a Display with Water Drops, *Peter Barnum, Srinivasa Narasimhan, Takeo Kanade*

1110 Data Handling Displays, *Maxim Lazarov, Hamed Pirsiavash, Behzad Sajadi, Uddipan Mukherjee, Aditi Majumder*

1130 Transparent Watermarking using Bidirectional Imaging, *Kristin Dana, Gabriela Livescu*

1150 Lunch Break

S5: Invited Talk (1320–1405)

1320 TBD

S6: Calibration (1405–1505)

1405 Geometric Video Projector Auto-Calibration, *Jamil Draréni, Sébastien Roy, Peter Sturm*

1425 A User-Friendly Method to Geometrically Calibrate Projector-Camera Systems, *Samuel Audet, Masatoshi Okutomi*

1445 Color Calibration of Multi-Projector Displays through Automatic Optimization of Hardware Settings, *R. Matt Steele, Mao Ye, Ruigang Yang*

1505 Aftenoon Break

S7: Acquisition 2 (1530–1610)

1530 Shadow Multiplexing for Real-Time Silhouette Extraction, *Tom Cuypers, Yannick Francken, Johannes Taelman, Philippe Bekaert*

1550 Multi-view Reconstruction for Projector Camera Systems Based on Bundle Adjustment, *Ryo Furukawa, Kenji Inose, Hiroshi Kawasaki*

S8: Panel Session (1610–1700)

1610 Panel members TBD

S5: Capstone Talk (1700–1745)

1700 TBD

1745 Awards & Closing Remarks

Biometrics

Location: Splash 1-4

Schedule:

0900 Opening Remarks

S1: 3D Face (0910–1000)

0910 Impact of Involuntary Subject Movement on 3D Face Scans, *Chris Boehnen, Patrick Flynn*

0920 A Case for the Average-Half-Face in 2D and 3D for Face Recognition, *Josh Harguess, J. K. Aggarwal*

0930 Evaluation of Spatio-Temporal Regional Features for 3D Face Analysis, *Yi Sun, Lijun Yin*

0940 In Between 3D Active Appearance Models and 3D Morphable Models, *Jingu Heo, Marios Savvides*

0950 Face Recognition At-a-Distance Based on Sparse-Stereo Reconstruction, *Ham Rara, Shireen Elhabian, Asem Ali, Mike Miller, Thomas Starr, Aly Farag*

1000 Morning Break

S2: 3D Models (1030–1110)

1030 Posture Invariant Gender Classification for 3D Human Models, *Stefanie Wuhrer, Chang Shu, Marc Rioux*

1040 Combining 2D and 3D Hand Geometry Features for Biometric Verification, *Vivek Kanhangad, Ajay Kumar, David Zhang*

1055 Recognition of Walking Humans in 3D: Initial Results, *Koichiro Yamauchi, Bir Bhanu, Hideo Saito*

S3: Multi-modal (1110–1145)

1110 Audio-Visual Speech Synchronization Detection Using A Bimodal Linear Prediction Model, *Kshitiz Kumar, Jiri Navratil, Etienne Marcheret, Vit Libal, Ganesh Ramaswamy, Gerasimos Potamianos*

1125 Face Recognition by Fusion of Local and Global Matching Scores using DS Theory: An Evaluation with Uni-Classifier and Multi-classifier Paradigm, *Dakshina R. Kisku, Massimo Tistarelli, Jamuna Kanta Sing, Phalguni Gupta*

1135 Remote Audio/Video Acquisition for Human Signature Detection, *Yufu Qu, Tao Wang, Zhigang Zhu*

1145 Lunch Break

S4: Systems & Security (1330–1425)

1330 Effect of Plastic Surgery on Face Recognition: A Preliminary Study, *Richa Singh, Mayank Vatsa, Afzel Noore*

1345 Identifying Sensors from Fingerprint Images, *Nick Bartlow, Nathan Kalka, Bojan Cukic, Arun Ross*

1400 Biometric Data Hiding: A 3 Factor Authentication Approach to Verify Identity with a Single Image Using Steganography, Encryption and Matching, *Neha Agrawal, Marios Savvides*

1410 A Coding Scheme for Indexing Multimodal Biometric Databases, *Aglika Gyaourova, Arun Ross*

S5: Face (1425–1505)

1425 Square Loss based Regularized LDA for Face Recognition Using Image Sets, *Yanlin Geng, Caifeng Shan, Pengwei Hao*

1440 Measuring Changes in Face Appearance through Aging, *Marcos Ortega, Linda Brodo, Manuele Bicego, Massimo Tistarelli*

1455 On Conversion from Color to Gray-scale Images for Face Detection, *Juwei Lu, Kostas N. Plataniotis*

1505 Afternoon Break

S6: Quality (1520–1600)

1520 Global and Local Quality Measures for NIR Iris Video, *Jinyu Zuo, Natalia A. Schmid*

1535 A Method for Selecting and Ranking Quality Metrics for Optimization of Biometric Recognition Systems, *Natalia A. Schmid, Francesco Nicolo*

1545 Improving Face Recognition with a Quality-based Probabilistic Framework, *Necmiye Ozay, Yan Tong, Frederick W. Wheeler, Xiaoming Liu*

CVPR for Human Communicative Behaviour Analysis (CVPR4HB)

Location: Splash 5-8

Schedule:

0900 Opening Remarks

S1: Keynote Session 1 (1015–1200)

0915 **Keynote:** Use of Active Appearance Models for Analysis and Synthesis of Naturally Occurring Behavior, *Jeffrey F. Cohn (University of Pittsburgh)*

1000 Morning Break

S2: Oral Session 1 (1015–1200)

1015 Robust Facial Action recognition from real-time 3D streams, *Filareti Tsalakanidou, Sotiris Malassiotis*

1040 Automatically Detecting Action Units from Faces of Pain: Comparing Shape and Appearance Features, *Patrick Lucey, Jeffrey Cohn, Simon Lucey, Sridha Sridharan, Kenneth M. Prkachin*

1105 Physiological Modelling for Improved Reliability in Silhouette-Driven Gradient-Based Hand Tracking, *Paris Kaimakis, Joan Lasenby*

1130 An Implicit Spatiotemporal Shape Model for Human Activity Localization and Recognition, *Antonios Oikonomopoulos, Ioannis Patras, Maja Pantic*

S3: Keynote Session 2 (1200–1245)

1200 **Keynote:** Modeling and Exploiting the Spatio-temporal Facial Action Dependencies for Robust Spontaneous Facial Expression Recognition, *Qiang Ji (RPI) (with Yan Tong and Jixu Chen)*

1245 Lunch Break (and Poster Preparation)

S4: Keynote Session 3 (1415–1500)

1200 **Keynote:** Social Signal Processing: Understanding Social Interactions through Nonverbal Behaviour Analysis, *Alessandro Vinciarelli (IDIAP) (with Hugues Salamin and Maja Pantic)*

S5: Poster Session & Coffee Break (1500–1545)

- Action Recognition via Local Descriptors and Holistic Features, *Xinghua Sun, Mingyu Chen, Alexander Hauptmann*
- Automatic Recognition of Fingerspelled Words in British Sign Language, *Stephan Liwicki, Mark Everingham*
- An Alignment Based Similarity Measure for Hand Detection in Cluttered Sign Language Video, *Ashwin Thangali, Stan Sclaroff*
- A Framework for Automated Measurement of the Intensity of Non-Posed Facial Action Units, *Mohammad H. Mahoor, Steven Cadavid, Daniel S. Messinger, Jeffrey F. Cohn*
- Fusion by Optimal Dynamic Mixtures of Proposal Distributions, *Tony X. Han, Huazhong Ning, Thomas S. Huang*
- Audiovisual Event Detection Towards Scene Understanding, *Cristian Canton-Ferrer, Taras Butko, Carlos Segura, Xavier Giró, Climent Nadeu, Javier Hernando, Josep R. Casas*

S6: Oral Session 2 (1545–1730)

1545 Dominance Detection in Face-to-face Conversations, *Sergio Escalera, Rosa Maria Anguera, Jordi Vitrià, Petia Radeva, Maria Teresa Anguera*

1610 Auditory Dialog Analysis and Understanding by Generative Modelling of Interactional Dynamics, *Marco Cristani, Anna Pesarin, Carlo Drioli, Alessandro Tavano, Alessandro Perina, Vittorio Murino*

1635 Multi-modal Laughter Recognition in Video Conversations, *Sergio Escalera, Eloi Puertas, Petia Radeva, Oriol Pujol*

1700 Head Pose Estimation Using Spectral Regression Discriminant Analysis, *Caifeng Shan, Wei Chen*

S7: Panel Discussion (1730–1830)

1730 Panellists — *Qiang Ji, Alessandro Vinciarelli, Jeffrey Cohn, Thomas Huang and Maja Pantic*

Joint VCL-ViSU Workshop

Note: This is a joint workshop for Visual & Contextual Learning (VCL) and Visual Scene Understanding

Location: Splash 9-10

Schedule:

0900 Welcome Message

VCL — Keynote Speaker (0910–0940)

0910 **Keynote:** TBD, *Antonio Torralba (CSAIL, MIT)*

VCL — Invited Talk (0940–1010)

0940 Invited Talk: TBD, *Kristen Grauman (Univ. of Texas at Austin)*

1010 Morning Break

VCL — Keynote Speaker (1030–1100)

1030 **Keynote:** TBD, *David Forsyth (Univ. of Illinois at Urbana-Champaign)*

VCL — Industry Talk (1100–1130)

1100 TBD, *Jay Yagnik (Google Research)*

VCL — Short Presentations (1130–1200)

1130 Using Closed Captions to Train Activity Recognizers that Improve Video Retrieval, *Sonal Gupta, Raymond J. Mooney*

1145 **Invited Talk:** Talking Pictures: Temporal Grouping and Dialog-Supervised Person Recognition in Video, *Timothee Cour, Benjamin Sapp , Akash Nagle, Ben Taskar*

VCL-ViSU Spotlights (1205–1230)

1205 Multiple Label Prediction for Image Annotation with Multiple Kernel Correlation Models, *Oksana Yakhnenko, Vasant Honavar*

1210 HANOLISTIC: A Hierarchical Automatic Image Annotation System Using Holistic Approach, *Özge Öztimur Karadağ, Fatoş T. Yarman Vural*

1215 Categorization in Natural Time-Varying Image Sequences, *Teresa Ko, Stefano Soatto, Deborah Estrin*

1220 Scenes vs. Objects: a Comparative Study of Two Approaches to Context Based Recognition, *Andrew Rabinovich, Serge Belongie*

1225 Mining Discriminative Adjectives and Prepositions for Natural Scene Recognition, *Bangpeng Yao, Juan Carlos Niebles, Fei-Fei Li*

VCL-ViSU Poster Session (1230–1410)

- Adaptive Object Classification in Surveillance System by Exploiting Scene Context, *Jitao Sang, Zhen Lei, Shengcai Liao, Stan Z. Li*
- Multiple Label Prediction for Image Annotation with Multiple Kernel Correlation Models, *Oksana Yakhnenko, Vasant Honavar*
- HANOLISTIC: A Hierarchical Automatic Image Annotation System Using Holistic Approach, *Özge Öztimur Karadağ, Fatoş T. Yarman Vural*
- Combining Appearance and Motion for Human Action Classification in Videos, *Paramveer S. Dhillon, Sebastian Nowozin, Christoph H. Lampert*
- Using Closed Captions to Train Activity Recognizers that Improve Video Retrieval, *Sonal Gupta, Raymond J. Mooney*
- Event Detection Using Local Binary Pattern Based Dynamic Textures, *Yunqian Ma, Petr Cisar*
- Nonparametric Bottom-Up Saliency Detection by Self-Resemblance, *Hae Jong Seo, Peyman Milanfar*
- Categorization in Natural Time-Varying Image Sequences, *Teresa Ko, Stefano Soatto, Deborah Estrin*
- Content and Context-Based Multi-Label Image Annotation, *Hong Lu, Yingbin Zheng, Xiangyang Xue, Yuejie Zhang*
- Estimating Object Region from Local Contour Configuration, *Tetsuaki Suzuki, Martial Hebert*
- Head and Gaze Dynamics in Visual Attention and Context Learning, *Anup Doshi, Mohan M. Trivedi*

- Efficient Acquisition of Human Existence Priors from Motion Trajectories, *Hitoshi Habe, Hidehito Nakagawa, Masatsugu Kidode*
- Scenes vs. Objects: a Comparative Study of Two Approaches to Context Based Recognition, *Andrew Rabinovich, Serge Belongie*
- Towards Total Scene Understanding: Classification, Annotation and Segmentation in an Automatic Framework, *Li-Jia Li, Richard Socher, Fei-Fei Li*
- Mining Discriminative Adjectives and Prepositions for Natural Scene Recognition, *Bangpeng Yao, Juan Carlos Niebles, Fei-Fei Li*
- Hierarchical Audio-Visual Cue Integration Framework for Activity Analysis in Intelligent Meeting Rooms, *Shankar T. Shivappa, Mohan M. Trivedi, Bhaskar D. Rao*

1410 ViSU Introductions

ViSU — Panel 1 (1415–1500)

1415 Panel members TBD

1500 Afternoon Break

ViSU — Keynote Speaker (1520–1600)

1520 **Keynote:** TBD, *Jitendra Malik (Univ. of California at Berkeley)*

ViSU — Panel 2 (1600–1645)

1600 Panel members TBD

ViSU — Panel 3 (1645–1730)

1645 Panel members TBD

VCL-ViSU — Awards (1745-1830)

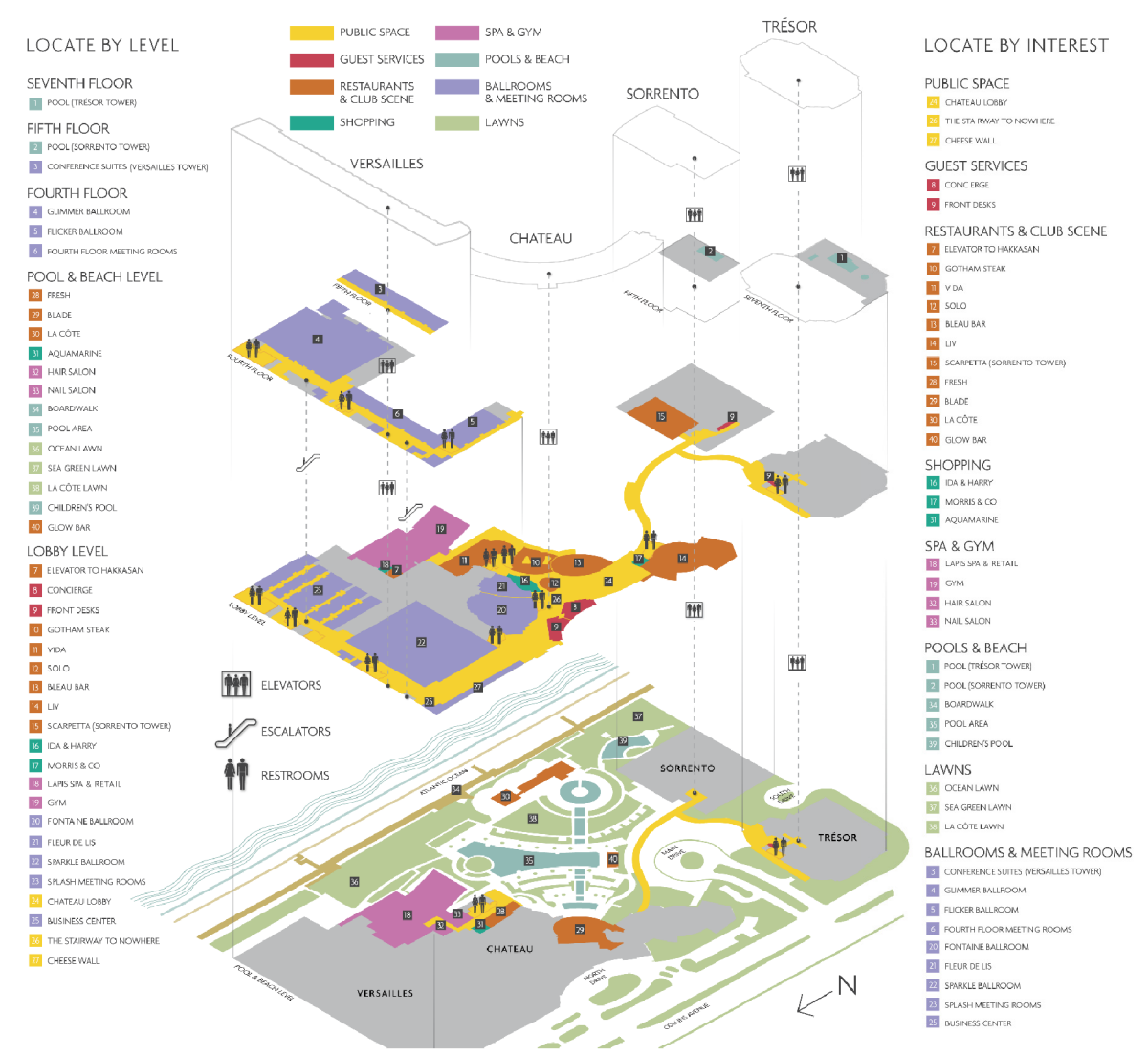
1745 Joint Awards and Final Remarks

Perfomance Evaluation of Tracking & Surveillance (PETS)

Location: Splash 11-12

Schedule:

Workshop program will be provided at CVPR 2009



LOCATE BY LEVEL

SEVENTH FLOOR
- 1 POOL (TRÉSOR TOWER)

FIFTH FLOOR
- 2 POOL (SORRENTO TOWER)
- 3 CONFERENCE SUITES (VERSAILLES TOWER)

FOURTH FLOOR
- 4 GLIMMER BALLROOM
- 5 FLICKER BALLROOM
- 6 FOURTH FLOOR MEETING ROOMS

POOL & BEACH LEVEL
- 28 FRESH
- 29 BLADE
- 30 LA CÔTE
- 31 AQUAMARINE
- 32 HAIR SALON
- 33 NAIL SALON
- 34 BOARDWALK
- 35 POOL AREA
- 36 OCEAN LAWN
- 37 SEA GREEN LAWN
- 38 LA CÔTE LAWN
- 39 CHILDREN'S POOL
- 40 GLOW BAR

LOBBY LEVEL
- 7 ELEVATOR TO HAKKASAN
- 8 CONCIERGE
- 9 FRONT DESKS
- 10 GOTHAM STEAK
- 11 VIDA
- 12 SOLO
- 13 BLEAU BAR
- 14 LIV
- 15 SCARPETTA (SORRENTO TOWER)
- 16 IDA & HARRY
- 17 MORRIS & CO
- 18 LAPIS SPA & RETAIL
- 19 GYM
- 20 FONTAINE BALLROOM
- 21 FLEUR DE LIS
- 22 SPARKLE BALLROOM
- 23 SPLASH MEETING ROOMS
- 24 CHATEAU LOBBY
- 25 BUSINESS CENTER
- 26 THE STAIRWAY TO NOWHERE
- 27 CHEESE WALL

LOCATE BY INTEREST

PUBLIC SPACE
- 24 CHATEAU LOBBY
- 26 THE STAIRWAY TO NOWHERE
- 27 CHEESE WALL

GUEST SERVICES
- 8 CONCIERGE
- 9 FRONT DESKS

RESTAURANTS & CLUB SCENE
- 7 ELEVATOR TO HAKKASAN
- 10 GOTHAM STEAK
- 11 VIDA
- 12 SOLO
- 13 BLEAU BAR
- 14 LIV
- 15 SCARPETTA (SORRENTO TOWER)
- 28 FRESH
- 29 BLADE
- 30 LA CÔTE
- 40 GLOW BAR

SHOPPING
- 16 IDA & HARRY
- 17 MORRIS & CO
- 31 AQUAMARINE

SPA & GYM
- 18 LAPIS SPA & RETAIL
- 19 GYM
- 32 HAIR SALON
- 33 NAIL SALON

POOLS & BEACH
- 1 POOL (TRÉSOR TOWER)
- 2 POOL (SORRENTO TOWER)
- 34 BOARDWALK
- 35 POOL AREA
- 39 CHILDREN'S POOL

LAWNS
- 36 OCEAN LAWN
- 37 SEA GREEN LAWN
- 38 LA CÔTE LAWN

BALLROOMS & MEETING ROOMS
- 3 CONFERENCE SUITES (VERSAILLES TOWER)
- 4 GLIMMER BALLROOM
- 5 FLICKER BALLROOM
- 6 FOURTH FLOOR MEETING ROOMS
- 20 FONTAINE BALLROOM
- 21 FLEUR DE LIS
- 22 SPARKLE BALLROOM
- 23 SPLASH MEETING ROOMS
- 25 BUSINESS CENTER

Upper Lobby Floor Plan

Fontainebleau Resort