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Message from the Program and General Chairs

Welcome to CVPR 2010 in San Francisco. We received 1724 submissions to the conference, a substantial increase on previous years. To select papers from these submissions, we invited 45 well-known vision researchers to act as Areas Chairs (ACs) and recruited an expert team of 718 Reviewers from the broader computer vision community. We again used the CMT conference management service sponsored by Microsoft Research to manage the submission and selection of papers from beginning to end.

After the submission deadline, the papers were distributed between the ACs, who in turn identified potential (and non-conflicted) reviewers for each of their assigned papers, from which the CMT system automatically selected three reviewers per paper. Reviewers were given seven weeks to complete their reviews, at which time the ACs stepped back in to finish their work: consolidating reviews and author rebuttals, initiating discussions for clarification, and making recommendations for decisions on papers. The process was designed to ensure that every paper and its reviews and author rebuttal were looked at by at least two ACs. To further support a thorough review process, at the AC Meeting in College Park, MD, we divided the ACs into four panels, with almost no conflict between the ACs and papers associated with each panel. The Program Chairs and one of the General Chairs served as the panel chairs and worked hard to maintain consistency between the panels. All decisions were made by at least two ACs working together and, as needed, by the whole panel. A consensus of the entire panel was sought on the most difficult cases. The ACs produced detailed consolidation reports to justify all decisions. The Program Chairs and General Chairs did not submit any papers to CVPR 2010, allowing them to work without any direct conflicts throughout the review process. Additionally, the respective panel 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 78 papers as orals (4.5%) and 383 papers as posters (22.2%), with an overall acceptance rate of 26.7%. There was no prior constraint, either on the number of orals or posters.

Following the success of the Doctoral Spotlight Sessions at CVPR 2009, we decided to include spotlight presentations for all posters within the main conference sessions. There will be one poster session following the program of oral and spotlight presentations on each day of the conference - taking place on Tuesday and Wednesday evening, and on Thursday afternoon. The primary aim is to give attendees sufficient understanding of all poster papers in their areas of interest to be able to target those they wish to follow-up on during the poster sessions.

We are again publishing the proceedings in DVD form. 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 the other members of the Organizing Committee, the Area Chairs, Reviewers, Authors, and the CMT team for the immense amount of hard work and professionalism that has gone in to making CVPR 2010. Our thanks also go to the organisers of previous CVPRs for their unstinting advice and support. Finally, we wish all delegates a highly stimulating, informative and enjoyable conference.

Organizing Committee and Outstanding Reviewers

CVPR 2010 Organizing Committee

Local Arrangements Chairs:

General Chairs: Larry Davis

Jitendra Malik

Program Chairs: Trevor Darrell

David Hogg

Fei-Fei Li

David Jacobs

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Andrew Zisserman

Outstanding Reviewers

We are pleased to recognize the following researchers as "Outstanding Reviewers for CVPR 2010". These reviewers were selected from over 700 reviewers for their hard work in providing detailed reviews for the papers assigned to them. These reviewers were identified by one or more of the CVPR Area Chairs, who found their reviews of high quality. Review load was also accounted for in this decision (reviewers with low review loads were discounted).

The CVPR 2010 Outstanding Reviewers are:

Vassilis Athitsos Marcin Marszalek Adrian Bartoli Jiri Matas Matthew Brown Greg Mori Gustavo Carneiro Bryan Morse

Taeg Sang Cho Srinivasa Narasimhan James Coughlan Bjorn Ommer

Jim Davis Jerry Prince
Patrick Flynn Sudeep Sarkar
Gang Hua Bernt Schiele
Ioannis Kakadiaris Leonid Sigal
Kyros Kutulakos Noah Snavely
Svetlana Lazebnik Anuj Srivastava
Anat Levin Rick Wildes

Jing Xiao

2

Ce Liu

Sunday, June 13

0700-0830 Breakfast

0700–1800 Registration (Garden Room)

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

Organizers: Katsushi Ikeuchi

Riad I. Hammoud Guoliang Fan Swarup Medasani Robert W. McMillan

Location: Seacliff A-B (1st Floor)

Schedule: Full day

0830 Introductions and Opening Remarks

S1: Keynote Talk & Invited Paper (0840-1000)

- o84o **Keynote:** Object Detection, Tracking and Identification Using Hyperspectral Video, *Dr. Rama Chellappa (Univ. of Maryland)*
- og4o Extraction of the Superficial Facial Vasculature, Vital Signs Waveforms and Rates Using Thermal Imaging, Travis R. Gault, Nicholas Blumenthal, Aly A. Farag, Tom Starr

1000 Morning Break

S2: Thermal Imaging for People Tracking (1030–1110)

- 1030 Wigner Distribution based Motion Tracking of Human Beings using Thermal Imaging, Chandrashekhar N. Padole, Luís A. Alexandre
- 1050 Feedback Scheme for Thermal-visible Video Registration, Sensor Fusion, and People Tracking, Atousa Torabi, Guillaume Massé, Guillaume-Alexandre Bilodeau

S3: Robust Object Detection (1110-1150)

- 1110 RelCom: Relational Combinatorics Features for Rapid Object Detection, Vijay Venkataraman, Fatih Porikli
- 1130 Concealed Object Detection and Segmentation over Millimetric Waves Images, Oriol Martinez, Luis Ferraz Colomina, Xavier Binefa, Ignacio Gómez, Carlos Dorronsoro

Best Paper Award (1150-1200)

1200 Lunch Break

S4: Tracking via Lighting Learning & Reflectance Modeling (1400–1440)

- 1400 Active Lighting Learning for 3D Model Based Vehicle Tracking, *Tingbo Hou, Sen Wang, Hong Qin*
- 1420 Tracking via Object Reflectance using a Hyperspectral Camera, *Hien Nguyen, Amit Banerjee, Rama Chellappa*

S5: Segmentation Assessment & Feature Matching (1440– 1520)

- 1440 Measuring the Quality of Figure/Ground Segmentations, *Michael Arens, Claus Anderer*
- 1500 Feature Matching In Underwater Environments Using Sparse Linear Combinations, Kenton Oliver, Weilin Hou, Song Wang

1520 Afternoon Break

S6: 3D Modeling via Active & Passive Sensing (1600-1640)

- 1600 Passive 3D Sensing, and Reconstruction using Multi-View Imaging, Firooz Sadjadi, Evan Ribnick
- 1620 Airborne Analysis and Assessment of Urban Traffic Scenes from LiDAR Data – Theory and Experiments, Wei Yao, Stefan Hinz, Uwe Stilla

S7: Open Discussion & Closing Remarks (1640-1700)

Evaluation remarks, Plan for 2011, Sponsorship, etc. –
 Get involved

Sunday, June 13

Workshops

Use of Context in Video Processing (UCVP)

Organizers: Hamid Aghajan

Louis-Philippe Morency

Anton Nijholt Ming-Hsuan Yang Yuri Iyanoy

Ralph Braspenning

Location: Bayview B (1st Floor)

Schedule: Full day 0845 Opening Remarks

ogoo **Invited Talk:** Visual Recognition Beyond Isolated Actors and Objects, *Fei-Fei Li (Stanford)*

1000 Morning Break

1030 CVPR Preview Talk: Talking Pictures: Temporal Grouping and Dialog-Supervised Person Recognition, Timothee Cour, Benjamin Sapp, Akash Nagle, Ben Taskar

1055 Door Detection via Signage Context-based Hierarchical Compositional Model, YingLi Tian, Cheng Chen

1120 Contextual Smoothing of Image Segmentation,
Jonathan Letham, Neil Robertson, Barry Connor

1145 Perspective and Appearance Context for People Surveillance in Open Areas, Giovanni Gualdi, Andrea Prati, Rita Cucchiara

1210 Lunch Break

1400 Invited Talk: Beyond Face Recognition: Using Social Context to Understand Images of People, Tsuhan Chen (Cornell)

1500 Context-driven Clustering by Multi-class Classification in an Active Learning Framework, Martin Godec, Sabine Sternig, Peter M. Roth, Horst Bischof

1525 Afternoon Break

1600 CVPR Preview Talk: Exploiting Hierarchical Context on a Large Database of Object Categories, Myung Jin Choi, Joseph J. Lim, Antonio Torralba, Alan S. Willsky 1625 Generative Modeling of Spatio-temporal Traffic Sign Trajectories, Karla Brkić, Siniša Šegvić, Zoran Kalafatić, Ivan Sikirić, Axel Pinz

1650 Group Discussion

1800 Closing Remarks

Online Learning for Computer Vision Workshop (OLCV)

Organizers: Fatih Porikli

Bernt Schiele Helmut Grabner

Location: Bayview A (1st Floor)

Schedule: Full day
0830 Welcome Message

o845 **Invited Talk:** Online Learning in Large Data Scenarios, *Jay Yagnik (Google Inc.)*

S1: Tracking (0930-1020)

og3o Online Multiple Classifier Boosting for Object Tracking, Tae-Kyun Kim, Thomas Woodley, Björn Stenger, Roberto Cipolla

ogs5 Online Learning for Attention, Recognition, and Tracking by a Single Developmental Framework, Juyang Weng, Matthew Luciw

1020 Morning Break

1040 Invited Talk: Online Learning: Label Elicitation And Beyond, Ashish Kapoor (Microsoft Research)

S2: Semi-supervised Learning (1125–1215)

1030 Online Semi-Supervised Perception: Real-Time Learning without Explicit Feedback, Branislav Kveton, Michal Valko, Matthai Philipose, Ling Huang

1050 TransientBoost: Online Boosting with Transient Data, Sabine Sternig, Martin Godec, Peter M. Roth, Horst Bischof

1215 Lunch Break

Sunday, June 13

Workshops

1400 Invited Talk: Efficient Fashion-driven Learning Approach to Model User Preferences in Online Shopping Scenarios, Burak Gokturk ()

S4: Large Scale Online Learning (1445–1535)

- 1445 Online Learning for Parameter Selection in Large Scale Image Search, *Mohamed Aly*
- 1510 OM-2: An Online Multi-class Multi-kernel Learning Algorithm, Luo Jie, Francesco Orabona, Marco Fornoni, Barbara Caputo, Nicolò Cesa-Bianchi
- 1535 Closing Remarks & Best Paper Award

Perceptual Organization in Computer Vision (POCV)

Organizers: Song Wang

Philippos Mordohai

Location: Seacliff C-D (1st Floor)

Schedule: Full day

- ogoo Invited Talk: The Role of Intermediate Shape Priors in Perceptual Grouping and Image Abstraction, Sven Dickinson (Univ. of Toronto)
- og50 Sparse Semi-Supervised Learning for Perceptual Grouping, Yi Hong, Jiayan Jiang, Zhuowen Tu

1015 Morning Break

- 1030 Shape Centered Interest Points for Feature Grouping, David Engel, Cristóbal Curio
- 1055 A Fully Statistical Framework for Shape Detection in Image Primitives, Jingyong Su, Anuj Srivastava, Zhiqiang Zhu, Fred Huffer

- 1120 Top-Down Pairwise Potentials for Piecing Together Multi-Class Segmentation Puzzles, Sudheendra Vijayanarasimhan, Kristen Grauman
- 1145 Detecting Intended Human Objects in Human-Captured Videos, Yuta Nakashima, Noboru Babaguchi, Jianping Fan
- 1210 Syntactic Image Parsing using Ontology and Semantic Descriptions, Ifeoma Nwogu, Venu Govindaraju, Chris Brown

1235 Lunch Break

- 1400 Invited Talk: Shape Packing With Contours and Segments for Object Recognition, Jianbo Shi (Univ. of Pennsylvania)
- 1450 Design and Perceptual Validation of Performance Measures for Salient Object Segmentation, Vida Movahedi, James H. Elder
- 1515 Fixation Driven Contour Completion with Angular Ordering, *Toshiro Kubotα*

1540 Afternoon Break

- 1600 Invited Talk: Tensor Voting: Review and New Elements, Gérard Medioni (Univ. of Southern California)
- 1650 A New Player-Enabled Rapid Video Navigation Method Using Temporal Quantization and Repeated Weighted Boosting Search, Junfeng Jiang, Xiao-Ping Zhang
- 1715 Scene Classification of Images and Video via Semantic Segmentation, *Heather Dunlop*

Sunday, June 13 Workshops

Embedded Computer Vision Workshop (ECVW)

Organizers: Ahmed Nabil Belbachir

Abbes Amira

Location: Regency (Main Floor)

Schedule: Full day 0830 Welcome Message

S1: Keynote Talk 1 (0835-0915)

o835 **Keynote:** Solving Vision Tasks with Variational Methods on GPUs, *Horst Bischof (Technical Univ. Graz)*

S2: Computer Vision on GPU (0915-1015)

- og15 GPU Computing with Orientation Maps for Extracting Local Invariant Features, *Naoyuki Ichimura*
- og35 Comparison of FPGA and GPU Implementations of Real-time Stereo Vision, *Ratheesh Kalarot, John Morris*
- 0955 Efficient Planar Features Matching for Robot Localization using GPU, Baptiste Charmette, Eric Royer, Frédéric Chausse

1015 Morning Break

S3: Mobile Computer Vision (1030-1110)

- 1030 Mobile Photo Collage, Man Hee Lee, Nitin Singhal, Sungdae Cho, In Kyu Park
- 1050 Indoor-Outdoor Detector for Mobile Phone Cameras Using Gentle Boosting, Uri Lipowezky, Ilya Vol

S4: Reconfigurable Computing for Computer Vision (1110– 1230)

- 1110 Dynamically Reconfigurable Architecture for Real Time Adaptation of H264/AVC-SVC Video Streams, Michael Guarisco, Hassan Rabah, Yves Berviller, Serge Weber, Abbes Amira
- 1130 Binary Histogram based Split/Merge Object Detection using FPGAs, Kofi Appiah, Hongying Meng, Andrew Hunter, Patrick Dickinson

- 1150 FPGA-Based Robust Ellipse Estimation for Circular Road Sign Detection, Samuele Martelli, Roberto Marzotto, Andrea Colombari, Vittorio Murino
- 1210 FPGA-GPU Architecture for Kernel SVM Pedestrian Detection, Sebastian Bauer, Sebastian Köhler, Konrad Doll, Ulrich Brunsmann

1230 Lunch Break

S5: Keynote Session 2 (1330-1410)

1330 **Keynote:** Emerging Applications of Embedded Vision, *Branislav Kisačanin (Texas Instruments)*

S6: Real-time Stereo Vision and Application (1410-1530)

- 1410 Fast Locally Consistent Dense Stereo on Multicore, Stefano Mattoccia
- 1430 A Census-Based Stereo Vision Algorithm Using Modified Semi-Global Matching and Plane Fitting to Improve Matching Quality, Martin Humenberger, Tobias Engelke, Wilfried Kubinger
- 1450 Real-Time Semi-Global Matching on the CPU, Stefan K. Gehriq, Clemens Rabe
- 1510 A Real-time Pedestrian Classification Method for Event-based Dynamic Stereo Vision, Stephan Schraml, Ahmed Nabil Belbachir, Norbert Brändle

1530 Afternoon Break

S7: Invited Talks: Advanced Vision Systems (1600–1745)

- 1600 High-Speed Vision Systems and Projectors for Real-Time Perception of the World, Shingo Kagami
- 1635 Mobile Panoramic Imaging System, Kari Pulli, Marius Tico, Yingen Xiong
- 1710 Perception for Manipulation in Robotics with OpenCV, *Gary Bradski*

1745 Paper award & Closing remarks

Sunday, June 13 **Tutorials**

Computer Vision in the Analysis of Master Drawings and Paintings

Organizer: David G. Stork

Time: 0830-1800 (All Day) Location: Marina Room (1st Floor)

Description: In the past few years, a handful of scholars worldwide trained in computer vision, pattern recognition, image processing and art history have applied the techniques of computer vision to problems in the history and interpretation of art. These new computer methods, guided by art historical knowledge, are shedding new light on art works, artistic praxis, and more. Again and again, we see that for some problems these computer methods are more sensitive, more perceptive, than even a trained artist or art historian, at least for a handful of problems. For instance, visual psychologists have shown that most of us—trained art scholars and artists included—are not particularly good at judging perspective or the location of illumination in a photograph, and, by extension, in a painting but these new computer methods can be extremely good at just such tasks. Likewise, computer image processing methods can detect the subtlest variations in brush strokes, variations that elude most trained eyes. The computer methods do not supplant connoisseurship, of course, but enhance it, much like a microscope empowers a biologist. Moreover, some highly sophisticated methods, such as fractal analysis of Jackson Pollock's drip paintings, introduce new visual measures never considered by the art community. Computer methods also dewarp distorted images in curved mirrors depicted within paintings and thereby provide new views into the artists' studios. Finally, computer graphics reconstructions of artists' studios allow scholars to explore "what if" scenarios and thus better understand the working methods of some artists. As such, conservators, curators and art historians may find these computer methods to be valuable tools, once the strengths and limitations of these methods are fully understood.

Bidirectional Texture Function Modeling

Organizers: Michal Haindl

Jiří Filip

Time: 1400-1800 (Half Day-Afternoon) Location: Pacific Concourse I (Basement)

Description: Robust visual classification, segmentation, retrieval or view/illumination invariant methods dealing with images of textured natural materials, as well as augmented reality applications creating virtual objects in rendered scenes with real material surface optical properties, require realistic physically correct textures. Such texture representation considerably depends on the view and illumination directions and can be efficiently and the most accurately obtained in the form of rough surface textures represented by Bidirectional Texture Function (BTF).

BTF data are the most advanced and accurate digital representation of a real-world material visual properties to date, and their analysis provides abundant information about the measured material that cannot, for the majority, be attained using any alternative visual measurements or representations, e.g., image based relighting, bump/displacement mapping, spatially varying BRDFs, etc. The nature of BTF data allows their straightforward exploitation for design and testing of illumination and viewinvariant features and algorithms in numerous robust texture classification, segmentation and retrieval applications. Other image processing problems, such as image restoration, aging modeling, face recognition, security, 3D object recognition, content-based image retrieval and many other tasks can and should benefit from BTF comprehensive information. Additionally, applications of this advanced texture representation allow accurate photo-realistic material appearance approximation for such complex tasks as visual safety simulations or interior design in automotive/airspace industry, architecture or dermatology among others. Multispectral BTF is a seven-dimensional function that depends on view and illumination directions as well as on

planar texture coordinates. BTF is typically obtained by

Sunday, June 13 Tutorials

measurement of thousands of images covering many combinations of illumination and viewing angles. However, the large size of such measurements has prohibited their practical exploitation in any sensible application until recently. During the last few years the first BTF measurement, compression, modeling and rendering methods have emerged.

In this tutorial we show benefits of using BTF in common applications and explain principles of BTF measurement, modelling and visualization methods.

Multi-perspective Imaging, Reconstruction, & Rendering

Organizers: Jingyi Yu

Srikumar Ramalingam

Time:1400-1800 (Half Day-Afternoon)Location:Pacific Concourse M-N (Basement)

Description: A perspective image represents the spatial relationships of objects in a scene as they appear from a single viewpoint. In contrast, a multi-perspective image combines what is seen from several viewpoints into a single image. Despite their incongruity of views, effective multi-perspective images are able to preserve spatial coherence and can depict, within a single context, details of a scene that are simultaneously inaccessible from a single view, yet easily interpretable by a viewer. In computer vision, multi-perspective images have been used for analyzing structure revealed via motion and generating panoramic images with a wide field-of-view using mirrors.

In this tutorial, we provide a practical guide on topics in multiperspective modeling and reconstruction methods and multiperspective imaging systems. We start with a brief review of multi-perspective image techniques frequently employed by artists such as the visual paradoxes of Escher, the Cubism of Picasso and Braque, and multi-perspective panoramas in cel animations. We then characterize existing multi-perspective camera models, with an emphasis on their underlying geometry and image properties. Furthermore, we demonstrate how to use these camera models for creating specific multi-perspective rendering effects.

In the context of multi-view geometry in computer vision, there has been considerable research in generic imaging model which treats every camera as a mapping between pixels and their corresponding (half-)projection rays. For such a non-parametric model, practical calibration and multi-view geometry algorithms have been developed. Several existing multi-perspective imaging systems such as Catadioptric cameras, Light field cameras and other systems designed using computational photography methods can be addressed using generic algorithms. This tutorial will show practical (self-)calibration and explain various multi-view geometry concepts like Epipolar Geometry, Essential matrix, Fundamental matrix, Pose estimation, Motion estimation and 3D reconstruction algorithms for several of these multi-perspective imaging systems.

The participants learn about topics in multi-perspective modeling and imaging for extracting 3D geometry for computer vision and in rendering for generating compelling pictures for computer graphics. We hope to provide enough fundamentals to satisfy the technical specialist without intimidating curious graduate students interested in multiperspective images.

Sunday, June 13 Tutorials

Video Search Engines

Organizers: Cees G.M. Snoek

Arnold W.M. Smeulders

Time: 1400-1800 (Half Day-Afternoon)
Location: Pacific Concourse J-K (Basement)

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 overview the developments and future trends in the field on the basis of the TRECVID competition—the leading competition for video search engines—where we have consistently scored a top-three 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 query-context gap between the information need and the possible retrieval solutions
- 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. Starting 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 13 Tutorials

Advanced ITinCVPR in a Nutshell

Organizers: Francisco Escolano

Anand Rangarajan

Time: 1400-1800 (Half Day-Afternoon) **Location:** Pacific Concourse O (Basement)

Description: Information Theory (IT) plays a key role in formulating and designing algorithmic solutions to many problems in computer vision and pattern recognition (CVPR): image matching, clustering and segmentation, salient point detection, feature selection and dimensionality reduction, projection pursuit, optimal classifier design, and many others. Nowadays, researchers are routinely bringing IT elements to the CVPR arena. Among these elements are "measures" (entropy, mutual information, Kullback-Leibler and Jensen-Shannon divergence, Bregman divergence etc.), "principles" (maximum entropy, minimax entropy, minimum description length etc.) and "theories" (rate distortion theory, coding, the method of types etc.). Recently, alternative definitions for the latter measures and new methods of estimation which bypass the often cumbersome process of pdf estimation have been proposed. The tutorial will encompass (a) practical solutions for feature selection in very high dimensional patterns and images, (b) reformulation of shape matching problems using information-theoretic tools, (c) more efficient and faster clustering in high dimensions, (d) bypassing the estimation of scale-saliency points at many locations in images, (e) better methods for image registration, and many more.

This tutorial addresses the need for a unified presentation of the application of Information Theory in CVPR to the attendants. This is done through a novel perspective (exploring measures, principles, theories and estimators in key problems in Computer Vision). We will concentrate on several topics in order to give good examples of the application of this new perspective. Advanced theoretical insights will be complemented and illustrated by applications. Also, software/implementations will be available on the webpage for evaluation and testing of the main presented algorithms. Besides the slides of the tutorial, the slides of the

book "Information Theory in CVPR"

(http://www.rvg.ua.es/ITinCVPR) will be available for the students. Finally, we will also present some open questions and hot topics for current and future research. Our goal is to present information-theoretic tools to a growing CVPR field in a coherent way, by first introducing the main theory and then providing algorithms and applications.

Workshops

Monday, June 14

General Information

0700-0830 Breakfast

0700-1800 Registration (Garden Room)

3D Information Extraction for Video Analysis & Mining (VAM)

Organizers: Bir Bhanu

Arturo Donate Xiuwen Liu Igor Kozintsev

Location: Bayview B (1st Floor) **Schedule:** Half day (Morning)

S1: Introduction and Invited Paper (0830-0920)

0830 Opening Remarks

0840 Fusing Image Data with Location and Orientation Sensor Data Streams for Consumer Video Applications, Yoram Gat, Igor Kozintsev, Oscar Nestares

S2: Oral Session 1 (0920-10:00)

og20 Structure and Motion from Road-Driving Stereo Sequences, *Hoang Trinh, David McAllester*

og4o 3D Structure Estimation from Monocular Video Clips,

Arturo Donate, Xiuwen Liu

1000 Morning Break

S3: Oral Session 2 (1030-1130)

1030 Action Recognition in Spatiotemporal Volume, Yu Zhong, Mark Stevens

1050 Fast Probabilistic Estimation of Egomotion From Image Intensities., Jamil Draréni, Nicolas Martin, Sébastien Roy 1110 Unscented Transformation for Depth from Motion-Blur in Videos, Chandramouli Paramanand, Ambasamudram N. Rajagopalan

S4: Poster Session (1130-1230) - in Ballroom

- A Swarm Intelligence Based Searching Strategy for Articulated 3D Human Body Tracking, Xiaoqin Zhang, Weiming Hu, Xiangyang Wang, Yu Kong, Nianhua Xie, Hanzi Wang, Haibin Ling, Steve Maybank
- 3-D Scene Representation with Layered Non-Uniform Global Sampling, Huei-Yung Lin, Yu-Hua Xiao
- A Spatio-temporal Clustering Method Using Realtime Motion Analysis on Event-based 3D Vision, Stephan Schraml, Ahmed Nabil Belbachir
- Shot Boundary Detection in Videos Using Robust Three-Dimensional Tracking, Arturo Donate, Xiuwen Liu
- Error Model for Scene Reconstruction from Motion and Stereo, Songfan Yang, Bir Bhanu, Anastasios I. Mourikis

Analysis and Modeling of Faces and Gestures (AMFG)

Organizers: Wen-Yi Zhao

Xiaoou Tang Shaogang Gong Shuicheng Yan

Location: Pacific Concourse I (Basement)

Schedule: Half day (Morning)

0830 Welcome Message

S1: Oral Session (0835-1020)

0835 Topological Dynamic Bayesian Networks: Application to Human Face Identification across Ages, *Djamel Bouchaffra*

o855 A Robust Framework for Multiview Age Estimation,

Zhen Li, Yun Fu, Thomas S. Huang

- 0915 Affect Valence Inference From Facial Action Unit Spectrograms, Daniel McDuff, Rana El Kaliouby, Karim Kassam. Rosalind Picard
- 0935 Real Time Head Pose Tracking from Multiple Cameras with a Generic Model, *Qin Cai, Aswin* Sankaranarayanan, *Qing Zhang, Zhengyou Zhang,* Zicheng Liu
- o955 Spatio-Temporal GrabCut Human Segmentation for Face and Pose Recovery, Antonio Hernández, Miguel Reyes, Sergio Escalera, Petia Radeva
- 1015 Announcements & Best Paper Award

1020 Morning Break

S2: Poster Session (1030-1200) - in Ballroom

- Tensor-Jet: A Tensorial Representation of Local Binary Gaussian Jet Maps, John A. Ruiz Hernandez, James L. Crowley, Augustin Lux
- Facial Component Detection in Thermal Imagery,
 Brais Martinez, Xavier Binefa, Maja Pantic
- Gender Classification from Unconstrained Video
 Sequences, Meltem Demirkus, Matthew Toews, James
 J. Clark, Tal Arbel
- A Taxonomy of Face-models for System Evaluation, Vijay N. Iyer, Shane R. Kirkbride, Brian C. Parks, Walter J. Scheirer, Terry E. Boult
- Human Age Estimation: What is the Influence Across Race and Gender?, Guodong Guo, Guowang Mu
- A Study of Large-Scale Ethnicity Estimation with Gender and Age Variations, Guodong Guo, Guowang Mu
- Automated Pose Estimation in 3D Point Clouds
 Applying Annealing Particle Filters and Inverse
 Kinematics on a GPU, Nicolas H. Lehment, Dejan Arsić,
 Moritz Kaiser, Gerhard Rigoll
- Face Age Estimation Using Model Selection, Cuixian Chen, Yaw Chang, Karl Ricanek, Yishi Wang
- A Hierarchical Approach to Facial Aging, Amrutha Sethuram, Karl Ricanek, Eric Patterson

Workshop on Camera Networks (WCN)

Organizers: Amit K. Roy-Chowdhury

Stan Sclaroff

Demetri Terzopoulos

Bir Bhanu

Location: Seacliff B (1st Floor) **Schedule:** Half day (Morning)

0830 Welcome and opening remarks

- 0840 Event Driven Software Architecture for Multi-camera and Distributed Surveillance Research Systems, Roberto Vezzani, Rita Cucchiara
- ogoo Traffic Analysis with Low Frame Rate Camera Networks , *Tae Eun Choe, Mun Wai Lee, Niels Haering*
- 0920 Multiple Instance Learning from Multiple Cameras, Peter M. Roth, Christian Leistner, Armin Berger, Horst Bischof
- og4o Invited Talk: An ONR Perspective on Basic Research Issues and Applications of Camera Networks, *Behzad* Kamgar-Parsi (Office of Naval Research)

1000 Morning Break

- 1030 Invited Talk: Really Wide Areas: Analysis of City-Wide Aerial Video, Anthony Hoggs, (Kitware)
- 1100 Design and Implementation of a Wide Area, Large-Scale Camera Network, Thomas Kuo, Zefeng Ni, Carter De Leo, B. S. Manjunath
- 1120 Distributed Calibration of Pan-Tilt Camera Network using Multi-Layered Belief Propagation, Ayesha Choudhary, Gaurav Sharma, Santanu Chaudhury, Subhashis Banerjee
- 1240 Rapidly Deployable Video Analysis Sensor Units for Wide Area Surveillance, Zeeshan Rasheed, Geoff Taylor, Li Yu, Mun Wai Lee, Tae Eun Choe, Feng Guo, Asaad Hakeem, Krishnan Ramnath, Martin Smith, Atul Kanaujia, Dana Eubanks, Niels Haering
- 1200 Invited Talk: Tracking and Recognition of Humans/Faces in a Camera Network, Rama Chellappa (Univ. of Maryland)

Workshops

Computer Vision for Human-Robot Interaction (CVforHRI)

Organizers: Caroline Pantofaru

Leila Takayama Rainer Stiefelhagen Gary Bradski

Location: Pacific Concourse I (Basement)

Schedule: Half day (Afternoon)

1400 Opening Remarks

1415 Invited Talk: TBA, Maja Mataric (USC)

- 1500 Appearance-based Object Reacquisition for Mobile Manipulation, Matthew R. Walter, Yuli Friedman, Matthew Antone, Seth Teller
- 1515 A Graphical Model for Unifying Tracking and Classification within a Multimodal Human-Robot Interaction Scenario, Tobias Rehrl, Jürgen Gast, Nikolaus Theißing, Alexander Bannat, Dejan Arsić, Frank Wallhoff, Gerhard Rigoll, Christoph Mayer, Bernd Radiq

1530 Afternoon Break

- 1600 Integrating Vision for Human-Robot Interaction, Benjamin R. Fransen, Wallace E. Lawson, Magdalena D. Bugajska
- 1615 Viewing Direction Estimation Based on 3D Eyeball Construction for HRI, Michael Reale, Terry Hung, Lijun Yin
- 1630 Single Snapshot-Based 3D Head Pose Initialization for Tracking in an HRI Scenario, Fadi Dornaika, Bogdan Raducanu
- 1645 Invited Talk: TBA, Greg Mori (Simon Fraser Univ.)
- 1730 Panel Discussion

Computer Vision for Computer Games (CVCG)

Organizers: Vasileios Argyriou

Adrian Hilton Ioannis Kakadiaris Maria Petrou

Location: Seacliff C-D (1st Floor) **Schedule:** Half day (Afternoon)

- 1400 **Invited Talk:** Human Action Recognition, *Mubarak*Shah (Univ. of Central Florida)
- 1445 Invited Talk: Programmable Processors for Visionbased Toys and Games, *Branislav Kisacanin (Texas Instruments)*

1530 Afternoon Break

1600 Invited Talk: A Vision System Pipeline on GPUs: From Matlab to Shaders to CUDA, Jeffrey Ng (MIT)

Oral Papers (1645-1745)

- 1645 Human Pose Estimation from a Single View Point, Real-Time Range Sensor, Matheen Siddiqui, Gérard Medioni
- 1700 Fast and Robust CAMShift Tracking, David Exner, Erich Bruns, Daniel Kurz, Anselm Grundhöfer, Oliver Bimber
- 1715 FlowGames, Jakob Santner, Manuel Werlberger, Thomas Mauthner, Wolfgang Paier, Horst Bischof
- 1730 Real-Time 3D Multi-Person Tracking Using Monte Carlo Surface Sampling, Cristian Canton-Ferrer, Josep R. Casas, Montse Pardàs

Posters (1600–1730): in Ballroom throughout the workshop

- Automatic Seamless Video Mosaic from Webcams using LSF Techniques, Kondela Solo Emmanuel, Dong Jun Huang
- Sparse Representations For Facial Expressions Recognition via la optimization, Stefanos Zafeiriou, Maria Petrou
- Image Quality Assessment Using a Rotated Gaussian Discrimination Function, Bobby Geary, Christos Grecos

Monday, June 14

Workshops

- Automatic Change Detection in an Indoor
 Environment, Hussein Al-Khateeb, Maria Petrou
- Dense Photometric Stereo Reconstruction on Many Core GPUs, Andreas Varnavas, Vasileios Argyriou, Jeffrey Ng, Anil A. Bharath
- Immersive and Perceptual Human-Computer Interaction Using Computer Vision Techniques, Jinchang Ren, Theodore Vlachos, Vasileios Argyriou
- Action Recognition by Employing Combined
 Directional Motion History and Energy Images, Md.

 Atiqur Rahman Ahad, Jookooi Tan, Hyoungseop Kim,
 Seiji Ishikawa

Socially Intelligent Surveillance and Monitoring (SISM)

Organizers: Vittorio Murino

Marco Cristani

Alessandro Vinciarelli

Isabella Poggi

Location: Seacliff A (1st Floor)

Schedule: Full day 0845 Opening Remarks

0900 Invited Talk: Show Me How You Move and I Tell You Who You Are: Body Motion and Personality, Karl Grammer (Ludwig Boltzmann Institute for Urban Ethology)

1000 Morning Break

- 1030 People Trajectory Mining with Statistical Pattern Recognition, Simone Calderara, Rita Cucchiara
- 1100 Dense Spatio-Temporal Motion Segmentation for Tracking Multiple Self-Occluding People, Martin Hofmann, Gerhard Rigoll, Thomas S. Huang
- 1130 Wrong Turn No Dead End: a Stochastic Pedestrian Motion Model, Stefano Pellegrini, Andreas Ess, Marko Tanaskovic, Luc Van Gool
- 1200 A Socio-Technical Approach for Event Detection in Security Critical Infrastructure, Philipp Blauensteiner, Martin Kampel, Christoph Musik, Stefan Vogtenhuber

1230 Lunch Break

- 1400 Invited talk: TBA, Pascal Fua (Ecole Polytechnique Federale Lausanne)
- 1500 Feature Co-occurrence Representation Based on Boosting for Object Detection, Yuji Yamauchi, Masanari Takaki, Takayoshi Yamashita, Hironobu Fujiyoshi

1530 Afternoon Break

- 1600 Device-Tagged Feature-based Localization and Mapping of Wide Areas with a PTZ Camera, Alberto Del Bimbo, Giuseppe Lisanti, Iacopo Masi, Federico Pernici
- 1630 Real-time Classification of Pedestrians and Cyclists for Intelligent Counting of Non-Motorized Traffic, Ahmed Nabil Belbachir, Stephan Schraml, Norbert Brändle
- 1700 Socially Intelligent Surveillance and Monitoring: Analysing Social Dimensions of Physical Space, Marco Cristani, Vittorio Murino, Alessandro Vinciarelli
- 1730 Discussion
- 1800 Closing Remarks

Monday, June 14

Workshops

Structured Models in Computer Vision (SMiCV)

Organizers: Christoph Lampert

Vittorio Ferrari Peter Vincent Gehler

Location: Pacific Concourse M-N (Basement)

Schedule: Full day

S1: Session 1 (0830-1005)

0830 Welcome and Opening Remarks

o835 Keynote Talk: TBA, Dan Huttenlocher (Cornell)

og35 Learning Prototypical Shapes for Object Categories, Nhon H. Trinh, Benjamin B. Kimia

1005 Morning Break

S2: Session 2 (1030-1200)

1030 Keynote Talk: Probabilistic Models for Holistic Scene Understanding, Daphne Koller (Stanford)

1130 Discriminative Models for Static Human-Object Interactions, Chaitanya Desai, Deva Ramanan, Charless Fowlkes

1200 Lunch Break

S3: Session 3 (1400-1530)

1400 **Keynote Talk:** Large Scale Scene and Object Recognition, *Antonio Torralba (MIT)*

1500 Multiple Pose Context Trees for Estimating Human Pose in Object Context, Vivek Kumar Singh, Furqan Muhammad Khan, Ram Nevatia

1530 Afternoon Break

S4: Session 4 (1600-1745)

1600 **Keynote Talk:** TBA, Thomas Hofmann (Google Inc.)

1700 Learning Class-Specific Image Transformations with Higher-Order Boltzmann Machines, Gary B. Huang, Erik Learned-Miller

1730 Best Paper Award and Closing Remarks

Advancing Computer Vision with Humans in the Loop (ACVHL)

Organizers: Devi Parikh

Andrew Gallagher Tsuhan Chen

Location: Pacific Concourse L (Basement)

Schedule: Full day 0830 Opening Remarks

0835 Keynote: Mine is Bigger than Yours: Big Datasets in Computer Vision, David Forsyth (Univ. of Illinois at Urbana-Champaign)

0920 The Benefits and Challenges of Collecting Richer Object Annotations, Ian Endres, Ali Farhadi, Derek Hoiem, David A. Forsyth

0945 The HPU, James Davis, Joan Arderiu, Henry Lin, Zeb Nevins, Sebastian Schuon, Orazio Gallo, Ming-Hsuan Yang

1010 Morning Break

1030 **Keynote:** What do you See and Remember when you Glance at a Scene? *Aude Oliva (MIT)*

1115 Hands by Hand: Crowd-sourced Motion Tracking for Gesture Annotation, Ian Spiro, Graham Taylor, George Williams, Christoph Bregler

1140 Online Crowdsourcing: Rating Annotators and Obtaining Cost-effective Labels, Peter Welinder, Pietro Perona

1205 Lunch Break

1420 **Keynote:** TBA, Fei-Fei Li (Stanford)

1505 Interactive Semantic Camera Coverage Determination using 3D Floorplans, Ish Rishabh, Ramesh Jain

1530 Afternoon Break

1600 Keynote: TBA, Antonio Torralba (MIT)

1645 Indoor-Outdoor Classification with Human Accuracies: Image or Edge Gist?, Christina Pavlopoulou, Stella X. Yu

Workshops

Mathematical Methods in Biomedical Image Analysis (MMBIA)

Organizers: William M. Wells III

Tanveer Syeda-Mahmood

Fei Wang

Hayit Greenspan

Location: Marina Room (1st Floor)

Schedule: Full day
0845 Opening Remarks

S1: Brain Segmentation and fMRI Analysis (0855-1010)

o855 Topology-Preserving STAPLE, John A. Bogovic, Pierre-Louis Bazin, Jerry L. Prince

- 0920 A Supervised Clustering Approach for Extracting Predictive Information from Brain Activation Images, Vincent Michel, Evelyn Eger, Christine Keribin, Jean-Baptiste Poline, Bertrand Thirion
- 0945 Nonparametric Hierarchical Bayesian Model for Functional Brain Parcellation, Danial Lashkari, Ramesh Sridharan, Edward Vul, Po-Jang Hsieh, Nancy Kanwisher, Polina Golland

1010 Morning Break

1030 Invited Talk: TBA, Prof. Mark Ellisman (UCSD)

S2: Registration and Atlas Methods (1130-1245)

- 1130 Structural Image Representation for Image Registration, *Christian Wachinger, Nassir Navab*
- 1155 An MRF-based Statistical Deformation Model for Morphological Image Analysis, Jesus J. Caban, Penny Rheingans, Terry Yoo
- 1220 An EM Algorithm for Brain Tumor Image Registration: A Tumor Growth Modeling Based Approach, Ali Gooya, George Biros, Christos Davatzikos

1245 Lunch Break

S3: Poster Session (1400-1530)) — in Ballroom

 Groupwise Morphometric Analysis Based on High Dimensional Clustering, Dong Hye Ye, Kilian M. Pohl, Harold Litt, Christos Davatzikos

- Synthesis of Stereoscopic Views from Monocular Endoscopic Videos, Jin Zhou, Qiang Zhang, Baoxin Li, Ananya Das
- Robust Feature Selection in Resting-State fMRI
 Connectivity Based on Population Studies, Archana
 Venkataraman, Marek Kubicki, Carl-Fredrik Westin,
 Polina Golland
- Tracking of Cell Population from Time Lapse and End Point Confocal Microscopy Images with Multiple Hypothesis Kalman Smoothing Filters, Lee-Ling S. Ong, Marcelo H. Ang Jr., H. Harry Asada
- Two-Point Correlation as a Feature for Histology Images: Feature Space Structure and Correlation Updating, Lee Cooper, Joel Saltz, Raghu Machiraju, Kun Huang
- Local Concept-Based Medical Image Retrieval with Correlation-Enhanced Similarity Matching Based on Global Analysis, Md Mahmudur Rahman, Sameer K. Antani, George R. Thoma
- Direction Field Diffusion on Cortical Surface via Graph Cuts, Gang Li, Lei Guo, Jingxin Nie, Kaiming Li, Tianming Liu
- Predicting the Histology of Colorectal Lesions in a Probabilistic Framework, Roland Kwitt, Andreas Uhl, Michael Häfner, Alfred Gangl, Friedrich Wrba, Andreas Vécsei
- A Mutual-Information Scale-space for Image Feature Detection and Feature-based Classification of Volumetric Brain Images, Matthew Toews, William M. Wells III
- Aligning Endoluminal Scene Sequences in Wireless Capsule Endoscopy, Michal Drozdzal, Laura Igual, Jordi Vitrià, Carolina Malagelada, Fernando Azpiroz, Petia Radeva
- Stability Effects of Finite Difference Methods on a Mathematical Tumor Growth Model, Parisa Mosayebi, Dana Cobzas, Martin Jagersand, Alberta Murtha

Workshops

- Constrained Non-rigid Registration Using Lagrange Multipliers for Application in Prostate Radiotherapy, Chao Lu, Sudhakar Chelikani, Xenophon Papademetris, Lawrence Staib, James Duncan
- Learning High-dimensional Image Statistics for Aabnormality Detection on Medical Images, Guray Erus, Evangelia I. Zacharaki, Nick Bryan, Christos Davatzikos
- Application of Trace-Norm and Low-Rank Matrix
 Decomposition for Computational Anatomy,
 Nematollah Batmanghelich, Ali Gooya, Stathis
 Kanterakis, Ben Taskar, Christos Davatzikos
- Graph-based Tracking of Tongue Contour in Ultrasound Sequences with Adaptive Temporal Regularization, Lisa Tang, Ghassan Hamarneh
- Cardiac Disease Detection from Echocardiogram using Edge Filtered Scale-invariant Motion Features, Ritwik Kumar, Fei Wang, David Beymer, Tanveer Syeda-Mahmood

1530 Afternoon Break

S3: Vascular and Cellular Imaging (1600—1740)

- 1540 Directional Mean Shift and its Application for Topology Classification of Local 3D Structures, Mehran Kafai, Kazunori Okada, Yiyi Miao
- 1605 Vascular Tree Reconstruction by Minimizing A Physiological Functional Cost, Yifeng Jiang, Zhenwu Zhang, Albert J. Sinusas, Xenophon Papademetris
- 1630 Radon-Like Features and their Application to Connectomics, Ritwik Kumar, Amelio Vázquez-Reina, Hanspeter Pfister
- 1655 Structural Correspondence as A Contour Grouping Problem, Elena Bernardis, Stella X. Yu
- 1740 Closing Remarks

Computer Vision Applications for the Visually Impaired (CVAVI)

Organizers: James Coughlan

Roberto Manduchi

Location: Pacific Concourse O (Basement)

Schedule: Full day

0850 Introduction and Opening Remarks

S1: Technology for Education (0910–1000)

- 0910 The Note-Taker: An Assistive Technology That Allows Students Who Are Legally Blind to Take Notes in the Classroom, John A. Black Jr, David S. Hayden
- 0935 Using Vision Based Tracking to Support Real-Time Graphical Instruction for Students Who Have Visual Impairments , Bing Fang, Francisco Oliveira, Francis Ovek

1000 Morning Break

S2: Mobility (1030-1120)

- 1030 Robot Vision for the Visually Impaired, Vivek Pradeep, Gérard Medioni, James Weiland
- 1055 Video-based Localization Without 3D Mapping for the Visually Impaired, Jason J. Liu, Cody Phillips, Kostas Daniilidis
- 1120 Keynote Talk I: The Human Side of Machine Vision-Divided Attention Issues and the Need for Closed-Loop Control, David A. Ross (Atlanta VA Rehab R&D Center)
- 1205 Demo: ShopMobile II: Eyes-Free Supermarket Grocery Shopping for Visually Impaired Mobile Phone Users, Vladimir A. Kulyukin, Aliasgar Kutiyanawala

1230 Lunch

- 1400 Keynote Talk II: A Lifetime of Mistakes in Assistive Technology: Lessons for Computer Vision, John Brabyn (Smith-Kettlewell Eye Research Inst.)
- 1430 Panel Discussion (1430-1450)

S3: Annotation/Enhancement (1450-1540)

- 1450 Color Contrast Enhancement for Visually Impaired people, *Anustup Choudhury, Gérard Medioni*
- 1515 A Computer-Vision-Assisted System for Videodescription Scripting, Langis Gagnon, Claude Chapdelaine, David Byrns, Samuel Foucher, Maquelonne Héritier, Vishwa Gupta

1540 Afternoon Break

S4: Object Recognition (1600-1740)

- 1600 Toward Real-Time Grocery Detection for the Visually Impaired, Tess Winlock, Eric Christiansen, Serge Belongie
- 1625 Robust Door Detection in Unfamiliar Environments by Combining Edge and Corner Features, Xiaodong Yang, Yingli Tian
- 1650 VizWiz::LocateIt Enabling Blind People to Locate Objects in Their Environment, Jeffrey P. Bigham, Chandrika Jayant, Andrew Miller, Brandyn White, Tom Yeh
- 1715 LookTel—A Comprehensive Platform for Computer-Aided Visual Assistance, Jeremi Sudol, Orang Dialameh, Chuck Blanchard, Tim Dorcey
- 1740 Concluding Remarks

Applications of Computer Vision in Archaeology (ACVA)

Organizers: Fernand Cohen

Benjamin Kimia Ko Nishino Gabriel Taubin

Location: Pacific Concourse H (Basement)

Schedule: Full day
0830 Introductory Remarks

S1: 3D Sensing and Reconstruction (0845-1025)

0845 Keynote Talk 1: TBA

- 0925 REVEAL Intermediate Report, Ebenezer Gay, David Cooper, Benjamin Kimia, Gabriel Taubin, Daniel Cabrini, Suman Karumuri, Will Doutre, Shubao Liu, Katarina Galor, Donald Sanders, Andrew Willis
- 0945 Virtual Reconstruction of Archaeological Vessels using Expert Priors & Surface Markings, Fernand Cohen, Ezgi Taslidere, Zexi Liu, Glen Muschio
- 1005 Robust One-Shot 3D Scanning Using Loopy Belief Propagation, Ali Osman Ulusoy, Fatih Calakli, Gabriel Taubin

1025 Morning Break

S2: Documentation and Visualization (1045-1245)

- 1045 **Keynote Talk 2:** TBA, *Katsushi Ikeutchi (Univ. of Tokyo)*
- 1125 Teleimmersive 3D Collaborative Environment for Cyberarchaeology, Gregorij Kurillo, Maurizio Forte, Ruzena Bajcsy
- 1145 A Complete, Automatic Procedure for Pottery Documentation and Analysis, Avshalom Karasik
- 1205 An Integrated Image and Sketching Environment for Archaeological Sites, Xuejin Chen, Yann Morvan, Yu He, Julie Dorsey, Holly Rushmeier
- 1225 Estimating Gothic Facade Architecture from Imagery, Andrew Willis, Yunfeng Sui, Katharina Galor, Donald Sanders

1245 Lunch Break

S3: The Archaeologist Perspective (1345-1525)

1345 **Keynote Talk 3:** TBA, Jed Levine (National Park Services)

1425 Invited Paper I: TBA

1445 Invited Paper II: TBA

1505 Invited Paper III: TBA

1525 Afternoon Break

S4: Reconstruction and Fragment Assembly (1540-1700)

- 1540 Classification of Archaeological Ceramic Fragments Using Texture and Color Descriptors, Patrick Smith, Dmitriy Bespalov, Ali Shokoufandeh, Patrice Jeppson
- 1600 Virtual Reconstruction of Archaeological Vessels using Convex Hulls of Surface Markings, Fernand Cohen, Zhongchuan Zhang, Patrice Jeppson
- 1620 HINDSITE: A User-Interactive Framework for Fragment Assembly, *Benjamin Kimia, H. Can Aras*
- 1640 Photometric Stereo using Graph Cut and Mestimation for a Virtual Tumulus in the Presence of Highlights and Shadows, Daisuke Miyazaki, Katsushi Ikeuchi
- 1700 **Panel Discussion:** What have we learned? (Panelists: TBA; Panel moderator: TBA)

Open Source Vision Software: Intro and Training

Organizers: Andrea Vedaldi

Brian Fulkerson Gary Bradski Vadim Pisarevsky

Radu Rusu Hailin Jin

Time: 0830-1800 (Full Day)

Location: Pacific Concourse J-K (Basement)

Description: The purpose of the tutorial is to teach students and researchers how to use effectively open source computer vision packages. The emphasis is on problem solving, with demos illustrating how to apply the software to relevant computer vision problems.

OpenCV

- Library overview (Gary Bradski, Vadim Pisarevsky)
- · History, License (BSD), Contents
- Documentation
- New C++ and Python interface
- Introduction to new toolbox organization:
 - -Object Recognition and Pose
 - -Odometry/Geometry
 - -Tracking
- · Demos in object recognition and tracking
- · Hands on Tutorials
 - -I/O, Pose and Recognition
- 3D Point Clouds Library (Radu Rusu)
 - -Overview
- Demos
 - -Scene segmentation
 - -Recognition for Manipulation
- · Hands on Tutorials
 - -I/O, finding surface types, recognition.

VLFeat

- Overview (Andrea Vedaldi, Brian Fulkerson)
 - -Getting ready (in about five minutes)
 - -VLFeat as a MATLAB toolbox
 - -Pointers to tutorials and documentation
- A walkthrough: object categorization 101
 - -Preparation -Features
 - -Visual vocabularies -Training and testing
 - -Performance evaluation, tuning, and tricks of the trade
- · Other VLFeat features
 - -Information-based feature compression (vl_aib)
 - Quick shift (vl_quickshift)
- · Final words
 - -A simple to use C API -GPL code
 - -Contributing: Git Hub hosting
- · Generic Image Library
- Overview
 - -License
 - -STL & Generic programming
 - -Performance
- Walkthrough
 - -Channels -Pixels
 - -Iterators -Image views
 - -Image algorithms -Color conversion
- Extensions
 - -IO -Numeric
- -OpenCV

ROS - Robot Operating System

- New, free (BSD license) open source Robot Operating System
- · Allows for seamless distributed computing
- · Packages cover:
 - -2D & 3D Perception
 - -Calibration 2D, 3D & 2D+3D
 - -Easy geometric transform support
 - -Visual Odometry & SLAM
 - -Object Recognition & Pose
 - -Control, Planning -Navigation, SLAM
 - -Simulation, Rendering -2D and 3D Visualization
 - -Teleoperation -3D modeling

3D Shape Reconstruction from Photographs: a Multi-View Stereo Approach

Organizers: Carlos Hernández

George Vogiatzis Yasutaka Furukawa

Time: 0830-1230 (Half Day-Morning)

Location: Seacliff C-D (1st Floor)

Description: The state-of-the-art in 3D reconstruction from photographs has undergone a revolution in the last few years. Coupled with the rapid developments in the digital photography industry, state-of-the-art multi-view stereo algorithms now rival laser range scanners in accuracy. This tutorial will provide an introduction to this exciting field of research. The aims of the tutorial are: firstly to give a step-by-step, practical guide to implementing and deploying a multi-view stereo system. To that end, the tutorial will be covering the basics of the multi-view stereo pipeline consisting of camera calibration, image segmentation, photo-consistency estimation from images, and surface extraction from photoconsistency. The focus will be on existing state-of-the-art techniques that will be provided as case studies illustrating the key principles involved.

Our second aim is to introduce potential new researchers to the field. The tutorial will therefore be identifying the current research frontier in the field, discussing some of the important open questions. Finally, we will be describing some possible avenues for future work including interactivity in MVS, the incorporation of geometric priors in 3d reconstruction and Internet-scale MVS.

This tutorial is based on a class offered at the ICVSS08 summer school, but is redesigned for computer vision researchers and engineers with more technical details.

Coded Computational Imaging

Organizers: Amit Agrawal

Ashok Veeraraghavan Srinivasa Narasimhan

Ankit Mohan

Time: 0830-1230 (Half Day-Morning)

Location: Regency (Main Floor)

Description: Computational imaging offers imaging functionalities beyond traditional imaging. Recently, we have seen tremendous interest in new forms of sampling the visual world. These include capturing the angular information in a light field camera for view interpolation and digital refocusing, modulating the temporal integration pattern of a camera for motion deblurring via coded exposure, modulating the aperture pattern for depth estimation and digital refocusing etc. Coupled with powerful reconstruction algorithms, computational imaging simplifies several vision problems.

In this course, we will present an extensive overview of computational imaging techniques while providing key ideas and insights into their workings. The participants will learn about topics related to computer vision, computational photography and computer graphics. We hope to provide enough fundamentals to satisfy the technical specialist as well as tools/softwares to aid graphics and vision researchers, including graduate students.

Learning Multi-subspaces in Computer Vision

Organizers: Yi Ma

Guillermo Sapiro René Vidal

Time: 0830-1230 (Half Day-Morning)

Location: Bayview A (1st Floor)

Description: Subspace methods are important for solving numerous problems in machine learning, pattern recognition, and computer vision. While subspace methods have been studied intensively (from PCA and beyond), new results are emerging from the areas of sparse coding, matrix factorization, and matrix completion. These results, in contrast with more classical subspace learning approaches, deal with multiple subspaces, of varying dimensions, automatically learned from the data. This makes the model extremely non-linear and rich. Applications of such methods range from computer vision (motion estimation, scene analysis, etc) to data mining (collaborative filtering, gene expression, etc). The goal of this tutorial is to present the audience with a unifying perspective of this problem, introducing the basic concepts and connecting multisubspace methods with sparse modeling, matrix factorization, and dimensionality reduction. The presentation of the theoretical foundations will be complemented with applications in computer vision including motion segmentation, face recognition, clustering, and registration.

Learnings from Founding a Computer Vision Startup

Organizers: Till Quack Jan Erik Solem

Time:

1400-1800 (Half Day-Afternoon)

Location: Bayview B (1st Floor)

Description: A couple of years ago we both founded startups in the computer vision field: kooaba (a spin-out from the ETH Zurich Computer Vision lab) and Polar Rose, respectively. Along the - sometimes bumpy - journey we learned a great deal of things, which we would like to share with the Computer Vision community. We found that creating your own startup is a very fulfilling experience and maybe also an interesting "career choice" after a completed PhD. In addition, it seems the time is just right to create more startups in the Vision field, since technology is in a cycle where many novel (consumer) applications become feasible.

The goal of this course is to give a rather broad overview of practices and tools which turned out to be useful for us. This spans as diverse topics as Funding, Software Engineering, Business Models, or Product Design. The goal is to provide, for each topic, also pointers and links to relevant resources.

Sparse Coding and Dictionary Learning for Image Analysis

Organizers: Francis Bach

Julien Mairal Jean Ponce Guillermo Sapiro

Time: 1400-1800 (Half Day-Afternoon)

Location: Bayview A (1st Floor)

Description: Sparse coding calls for modelling data vectors as a linear combination of a few dictionary elements. Whereas the question of "designing" the best dictionary adapted to natural signals has been the topic of much research in the past, this tutorial focuses on recent techniques that "learn" the basis set from training data. This has already proven very effective for signal reconstruction, leading to state-of-the-art results for many signal or image processing tasks, as well as advances in computer vision tasks such as object recognition.

A critical component in this approach is how to sparsely encode a signal given the dictionary. The tutorial will describe the state of the art in this area, ranging from greedy algorithms and la-optimization to simultaneous sparse coding of collections of signals. The actual dictionary plays a critical role, and it has been shown once and again that learned dictionaries significantly outperforms off-the-shelf ones such as wavelets. The second part of this tutorial will present the dictionary learning formulation and its links with existing matrix factorization techniques, as well as state-of-the-art applications to image processing tasks. The third part of the tutorial will be devoted to the most recent advances in the field, starting from learning dictionaries of image descriptors, a strategy used by the latest PASCAL VOC'og challenge winners, to task-driven dictionaries and structured sparsity.

A similar tutorial was given at ICCV'og in Kyoto, and its success prompts this second tutorial, with some updates. Part I and Part II of this tutorial will be similar to the one given at ICCV, (with less emphasis on optimization techniques), and Part III will contain new material

General-Purpose Vision Architecture, Invariance, Attention and Reasoning

Organizer: Juyang (John) Weng

Time: 1400-1800 (Half Day-Afternoon)

Location: Seacliff B (1st Floor)

Description: Much progress has been made in understanding and modeling the brain architecture. This tutorial reviews major published agent architectures, with an emphasis on their relationships. There is a large gap between connectionist modeling and symbolic modeling.

Connectionist modeling works on low-level sensory data, while symbolic modeling deals with high-level abstract symbols, but there is relatively little study for intermediate representations. This tutorial will focus on intermediate representation suited for invariant object recognition, scene classification, spatiotemporal event detection, attention in the presence of complex natural backgrounds, and reasoning under abstract contexts (e.g., goal directed) with pixels.

A fundamental challenge for connectionist representations is abstraction which symbolic representations enjoy through human hand-design. The term "abstract" refers to properties disassociated with any particular form or instance. The capability of attention is essential for internal abstraction from iconic stimuli. After the review, I introduce an architecture of the primate visual system, suited for computer vision. It deals with two major challenging open questions (1) how the system deals with space and time in generating intermediate internal representations at various levels, (2) how the system abstracts from concrete sensory experiences through attentions, (3) how the abstract context can be used to reason with pixels.

Human-centered Vision Systems: Context-driven Algorithm Design

Organizers: Nicu Sebe

Hamid Aghajan

Time: 1400-1800 (Half Day-Afternoon)

Location: Regency (Main Floor)

Description: This tutorial aims to offer its audience a new perspective towards opportunities in employing contextual data in human-centric video-based applications. The tutorial covers topics and case studies in algorithm design for different applications in smart environments and examines the use of contextual data in various forms to provide efficiency and reliability to the vision processing operation or adaptation to user preferences. Examples of inference of the user's activity, facial expression, eye gaze, gesture, emotion, and intention, as well as object recognition based on user interactions are used to support the presented topics.

Multi-camera systems and multimodal sensor networks have been recently studied as the physical embodiments of data acquisition and processing systems for creating novel smart environments and ambient intelligence applications. Areas such as smart homes, elderly and patient care, humancomputer interaction, ambience and lighting control, comfort and well-being, multimedia and gaming, and avatar-based social networks have been discussed as examples of such emerging applications. These applications share two key characteristics: they are enabled by real-time video (and other sensor data) processing and their objective is to serve a human (an individual user). Convergence of these two characteristics offers a unique opportunity for algorithm designers to employ a context-driven approach to visionbased inference. An area of research abundant with potentials is hence created when real-time vision processing demands meet access to contextual data acquired in various possible ways or accumulated over time from the environment and the human user. This tutorial covers key components and methods in the design of a human-centered vision system that employs context as a resource.

The course focuses on four aspects of context-driven information fusion in video processing for human-centric applications:

- Sources of contextual information and case studies in multi-camera networks;
- Interfacing vision processing with high-level data fusion to build up knowledge based and behavior models;
- Human pose, gaze, activity, facial expression, preferences, behavior modeling, and user feedback as sources of human-centric context;
- (4) Case studies of incorporating vision-based activity and expression recognition algorithms into adaptive systems that learn user preferences and adjust their services accordingly.

The course topics and case studies are supported by a large collection of implemented examples covering various layers of processing from early vision extraction to intermediate soft decisions in multi-camera processing or latent-space activity recognition, and to high-level inference of semantics based on visual clues.

Tuesday, June 15

0700-0830 Breakfast

0700-1800 Registration (Garden Room)

0800-2000 Exhibits (location TBA)

- Springer
- Mathworks
- Point Grey Research, Inc.
- Tandent Vision Science
- Aldebaran Robotics
- TYZX
- Now Publishers
- Elsevier
- Morgan & Claypool Publishers

0830-1010 Object Recognition I: Context (Ballroom A)

Chair - David Forsyth (UIUC)

Oral Papers (15 min. + 2 min. for questions)

- Object-Graphs for Context-Aware Category Discovery, Yong Jae Lee, Kristen Grauman
- Grouplet: A Structured Image Representation for Recognizing Human and Object Interactions, Bangpeng Yao, Li Fei-Fei
- Modeling Mutual Context of Object and Human Pose in Human-Object Interaction Activities, Bangpeng Yao, Li Fei-Fei
- The Chains Model for Detecting Parts by their Context, Leonid Karlinsky, Michael Dinerstein, Daniel Harari, Shimon Ullman
 - Poster Spotlights (90 seconds each)
- Detecting and Sketching the Common, Shai Bagon, Ori Brostovski, Meirav Galun, Michal Irani
- High Performance Object Detection by Collaborative Learning of Joint Ranking of Granule Features, Chang Huang, Ram Nevatia

- P-N Learning: Bootstrapping Binary Classifiers by Structural Constraints, Zdenek Kalal, Jiří Matas, Krystian Mikolajczyk
- 8. 3D Scene Priors for Road Detection, Jose M. Alvarez, Theo Gevers, Antonio M. Lopez
- Toward Coherent Object Detection And Scene Layout Understanding, Sid Ying-Ze Bao, Min Sun, Silvio Savarese
- 10. What is an Object?, Bogdan Alexe, Thomas Deselaers, Vittorio Ferrari
- 11. Fast Globally Optimal 2D Human Detection with Loopy Graph Models, *Tai-Peng Tian, Stan Sclaroff*
- Cascaded L₁-norm Minimization Learning (CLML)
 Classifier for Human Detection, Ran Xu, Baochang Zhang, Qixiang Ye, Jianbin Jiao
- 13. Convex Shape Decomposition, Hairong Liu, Wenyu Liu, Longin Jan Latecki
- 14. A Theory of Phase-sensitive Rotation Invariance with Spherical Harmonic and Moment-based Representations, Ramakrishna Kakarala, Dansheng Mao
- 15. Multi-Class Object Localization by Combining Local Contextual Interactions, Carolina Galleguillos, Brian McFee, Serge Belongie, Gert Lanckriet
- 16. Automatic Discovery of Meaningful Object Parts with Latent CRFs, Paul Schnitzspan, Stefan Roth, Bernt Schiele
- Exploiting Hierarchical Context on a Large Database of Object Categories, Myung Jin Choi, Joseph J. Lim, Antonio Torralba, Alan S. Willsky
- Learning Appearance in Virtual Scenarios for Pedestrian Detection, Javier Marín, David Vázquez, David Gerónimo, Antonio M. López

0830–1010 Color, Texture, Illumination & Reflectance (Ballrooms B-C)

Chair - David Kriegman (UCSD)

Oral Papers (15 min. + 2 min. for questions)

- Polynomial Shape from Shading, Ady Ecker, Allan D. Jepson
- Analysis of Light Transport in Scattering Media, Yasuhiro Mukaigawa, Yasushi Yagi, Ramesh Raskar

Tuesday, June 15 (Morning)

Program

 A New Texture Descriptor Using Multifractal Analysis in Multi-orientation Wavelet Pyramid, Yong Xu, Xiong Yang, Haibin Ling, Hui Ji

Poster Spotlights (90 seconds each)

- A Content-Aware Image Prior, Taeg Sang Cho, Neel Joshi, C. Lawrence Zitnick, Sing Bing Kang, Richard Szeliski, William T. Freeman
- Learning from Interpolated Images using Neural Networks for Digital Forensics, Yizhen Huang, Na Fan
- 6. A Probabilistic Image Jigsaw Puzzle Solver, *Taeg Sang Cho, Shai Avidan, William T. Freeman*
- Dynamic Texture Recognition Based on Distributions of Spacetime Oriented Structure, Konstantinos G. Derpanis, Richard P. Wildes
- 8. Finding Dots: Segmentation as Popping out Regions from Boundaries, *Elena Bernardis*, *Stella X. Yu*
- Estimating Optical Properties of Layered Surfaces Using the Spider Model , Tetsuro Morimoto, Robby T. Tan, Rei Kawakami, Katsushi Ikeuchi
- Optimal HDR Reconstruction with Linear Digital Cameras, Miguel Granados, Boris Ajdin, Michael Wand, Christian Theobalt, Hans-Peter Seidel, Hendrik P. A. Lensch
- Learning to Recognize Shadows in Monochromatic Natural Images, Jiejie Zhu, Kegan G. G. Samuel, Syed Z. Masood, Marshall F. Tappen
- 12. Context-Constrained Hallucination for Image Super-Resolution, Jian Sun, Jiejie Zhu, Marshall F. Tappen
- 13. Exploring Features in a Bayesian Framework for Material Recognition, Ce Liu, Lavanya Sharan, Edward H. Adelson, Ruth Rosenholtz
- 14. Image Restoration and Disparity Estimation from an Uncalibrated Multi-Layered Image, Takahiro Yano, Masao Shimizu, Masatoshi Okutomi
- 15. Estimation of Image Bias Field with Sparsity Constraints, Yuanjie Zheng, James C. Gee
- Performance Evaluation of Color Correction Approaches for Automatic Multi-view Image and Video Stitching, Wei Xu, Jane Mulligan
- 17. Surface Color Estimation Based on Inter- and Intra-Pixel Relationships in Outdoor Scenes, Shun Hirose, Tsuyoshi Suenaga, Kentaro Takemura, Rei Kawakami, Jun Takamatsu, Tsukasa Ogasawara

- 18. Estimating Demosaicing Algorithms using Image Noise Variance, *Jun Takamatsu, Yasuyuki Matsushita, Tsukasa Ogasawara, Katsushi Ikeuchi*
- 19. Object-to-Object Color Transfer: Optimal Flows and SMSP Transformations, Daniel Freedman, Pavel Kisilev
- 20. The Phase Only Transform for Unsupervised Surface Defect Detection, *Dror Aiger, Hugues Talbot*
- 21. Direct Image Alignment of Projector-Camera Systems with Planar Surfaces, Samuel Audet, Masatoshi Okutomi, Masayuki Tanaka
- 22. Spatialized Epitome and Its Applications, Xinqi Chu, Shuicheng Yan, Liyuan Li, Kap Luk Chan, Thomas S. Huang
- 23. Global Optimization for Estimating a BRDF with Multiple Specular Lobes, Chanki Yu, Yongduek Seo, Sang-Wook Lee
- 24. An Approach to Vectorial Total Variation based on Geometric Measure Theory, *Bastian Goldluecke, Daniel* Cremers
- 25. Robust Order-based Methods for Feature Description, Raj Gupta, Harshal Patil, Anurag Mittal

1010-1030 Morning Break

1030-1210 Shape Representation & Matching: Urban Scenes (Ballroom A)

Chair – Jana Kosecka (George Mason Univ.)

Oral Papers (15 min. + 2 min. for questions)

- Rectilinear Parsing of Architecture in Urban Environment,
 Peng Zhao, Tian Fang, Jianxiong Xiao, Honghui Zhang,
 Qinping Zhao, Long Quan
- Hybrid Multi-view Reconstruction by Jump-Diffusion, Florent Lafarge, Renaud Keriven, Mathieu Brédif, Vu Hoang Hiep
- Building Reconstruction using Manhattan-World Grammars, Carlos A. Vanegas, Daniel G. Aliaga, Bedřich Beneš
- Estimating Camera Pose from a Single Urban Ground-View Omnidirectional Image and a 2D Building Outline Map, Tat-Jen Cham, Arridhana Ciptadi, Wei-Chian Tan, Minh-Tri Pham, Liang-Tien Chia

Poster Spotlights (90 seconds each)

- Posture Invariant Surface Description and Feature Extraction, Stefanie Wuhrer, Zouhour Ben Azouz, Chang Shu
- Dense Non-rigid Surface Registration Using High-Order Graph Matching, Yun Zeng, Chaohui Wang, Yang Wang, Xianfeng Gu, Dimitris Samaras, Nikos Paragios
- Line Matching Leveraged By Point Correspondences, Bin Fan, Fuchao Wu, Zhanyi Hu
- Detecting and Parsing Architecture at City Scale from Range Data, Alexander Toshev, Philippos Mordohai, Ben Taskar
- Dynamic and Scalable Large Scale Image Reconstruction, Christoph Strecha, Timo Pylvänäinen, Pascal Fua
- Learning 3D Shape from a Single Facial Image via Nonlinear Manifold Embedding and Alignment, Xianwang Wang, Ruigang Yang
- Adaptive Pose Priors for Pictorial Structures, Benjamin Sapp, Chris Jordan, Ben Taskar
- 12. A Game-Theoretic Approach to Fine Surface Registration without Initial Motion Estimation, *Andrea Albarelli, Emanuele Rodolà, Andrea Torsello*
- 13. Global and Local Isometry-Invariant Descriptor for 3D Shape Comparison and Partial Matching, Huai-Yu Wu, Hongbin Zha, Tao Luo, Xu-Lei Wang, Songde Ma
- 14. Point-Based Non-Rigid Surface Registration with Accuracy Estimation, *Hidekata Hontani, Wataru Watanabe*
- 15. 3D Shape Correspondence by Isometry-Driven Greedy Optimization, Yusuf Sahillioğlu, Yücel Yemez
- On Growth and Formlets: Sparse Multi-Scale Coding of Planar Shape, Timothy D. Oleskiw, James H. Elder, Gabriel Peyré
- Growing Semantically Meaningful Models for Visual SLAM, Alexander Flint, Christopher Mei, Ian Reid, David Murray
- 18. Diffeomorphic Sulcal Shape Analysis for Cortical Surface Registration, Shantanu H. Joshi, Ryan P. Cabeen, Anand A. Joshi, Roger P. Woods, Katherine L. Narr, Arthur W. Toga

1030–1210 Computational Photography (Ballrooms B-C)

Chair - Irfan Essa (Georgia Tech)

Oral Papers (15 min. + 2 min. for questions)

- A Theory of Plenoptic Multiplexing, Ivo Ihrke, Gordon Wetzstein, Wolfgang Heidrich
- 2. Non-uniform Deblurring for Shaken Images, Oliver Whyte, Josef Sivic, Andrew Zisserman, Jean Ponce
- Axial Light Field for Curved Mirrors: Reflect Your Perspective, Widen Your View, Yuichi Taguchi, Amit Agrawal, Srikumar Ramalingam, Ashok Veeraraghavan
- Rectifying Rolling Shutter Video from Hand-held Devices, Per-Erik Forssén, Erik Ringaby

- 5. Correcting Over-Exposure in Photographs, *Dong Guo*, *Yuan Cheng, Shaojie Zhuo, Terence Sim*
- 6. Denoising vs. Deblurring: HDR Imaging Techniques Using Moving Cameras, *Li Zhang, Alok Deshpande, Xin Chen*
- Gradient-directed Composition of Multi-exposure Images, Wei Zhang, Wai-Kuen Cham
- 8. Warp Propagation for Video Resizing, Yuzhen Niu, Feng Liu, Xueqing Li, Michael Gleicher
- Sensor Saturation in Fourier Multiplexed Imaging, Gordon Wetzstein, Ivo Ihrke, Wolfgang Heidrich
- Noise-Optimal Capture for High Dynamic Range Photography, Samuel W. Hasinoff, Frédo Durand, William T. Freeman
- 11. Using Optical Defocus to Denoise, *Qi Shan, Jiaya Jia, Sing Bing Kang, Zenglu Qin*
- 12. Discontinuous Seam-Carving for Video Retargeting, Matthias Grundmann, Vivek Kwatra, Mei Han, Irfan Essa
- 13. Hybrid Shift Map for Video Retargeting, *Yiqun Hu, Deepu Rajan*
- 14. Geo-location Estimation from Two Shadow Trajectories, Lin Wu, Xiaochun Cao
- 15. Estimating Satellite Attitude from Pushbroom Sensors, Régis Perrier, Elise Arnaud, Peter Sturm, Mathias Ortner
- 16. Optimal Coded Sampling for Temporal Super-Resolution, Amit Agrawal, Mohit Gupta, Ashok Veeraraghavan, Srinivasa G. Narasimhan

- Efficient Filter Flow for Space-Variant Multiframe Blind Deconvolution, Michael Hirsch, Suvrit Sra, Bernhard Schölkopf, Stefan Harmeling
- Regenerative Morphing, Eli Shechtman, Alex Rav-Acha, Michal Irani, Steve M. Seitz

1210-1340 Lunch on your own

1210-1340 Springer IJCV Board Meeting (meet at Springer exhibit) (by invitation only)

1210-1340 Doctoral Consortium

(by invitation only)

Supported by:







- · Ahmed Bilal Ashraf (Carnegie Mellon University)
- Dhruv Batra (Carnegie Mellon University)
- Guy Ben-Yosef (Ben Gurion University)
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- Praveen Srinivasan (University of Pennsylvania)
- Andrew Temlyakov (University of South Carolina)
- Gordon Wetzstein (University of British Columbia)
- Qingxiong Yang (Univ. of Illinois at Urbana-Champaign)

1340-1520 Motion & Tracking I: Tracking People (Ballroom A)

Chair - Bill Triggs (CNRS)

Oral Papers (15 min. + 2 min. for questions)

- Monocular 3D Pose Estimation and Tracking by Detection, Mykhaylo Andriluka, Stefan Roth, Bernt Schiele
- Dynamical Binary Latent Variable Models for 3D Human Pose Tracking, Graham W. Taylor, Leonid Sigal, David J. Fleet, Geoffrey E. Hinton
- Contour People: A Parameterized Model of 2D Articulated Human Shape, Oren Freifeld, Alexander Weiss, Silvia Zuffi, Michael J. Black
- Combining Discriminative and Generative Methods for 3D Deformable Surface and Articulated Pose Reconstruction, Mathieu Salzmann, Raquel Urtasun

Poster Spotlights (90 seconds each)

- Efficient Extraction of Human Motion Volumes by Tracking, Juan Carlos Niebles, Bohyung Han, Li Fei-Fei
- Multisensor-Fusion for 3D Full-Body Human Motion Capture, Gerard Pons-Moll, Andreas Baak, Thomas Helten, Meinard Müller, Hans-Peter Seidel, Bodo Rosenhahn
- An Object-Dependent Hand Pose Prior from Sparse Training Data, Henning Hamer, Juergen Gall, Thibaut Weise, Luc Van Gool
- Vehicle Detection and Tracking in Wide Field-of-View Aerial Video, Jianjian Xiao, Hui Cheng, Harpreet Sawhney, Feng Han
- Multi-Target Tracking by On-Line Learned Discriminative Appearance Models, Cheng-Hao Kuo, Chang Huang, Ramakant Nevatia
- 10. Tracking with Local Spatio-Temporal Motion Patterns in Extremely Crowded Scenes, Louis Kratz, Ko Nishino
- AAM based Face Tracking with Temporal Matching and Face Segmentation, Mingcai Zhou, Lin Liang, Jian Sun, Yangsheng Wang
- 12. Human Identity Recognition in Aerial Images, *Omar Oreifej, Ramin Mehran, Mubarak Shah*
- 13. Silhouette Transformation based on Walking Speed for Gait Identification, Akira Tsuji, Yasushi Makihara, Yasushi Yagi

- 14. PROST: Parallel Robust Online Simple Tracking, Jakob Santner, Christian Leistner, Amir Saffari, Thomas Pock, Horst Bischof
- 15. Player Localization Using Multiple Static Cameras for Sports Visualization, Raffay Hamid, Ram Krishan Kumar, Matthias Grundmann, Kihwan Kim, Irfan Essa, Jessica Hodgins
- 16. An Online Approach: Learning-Semantic-Scene-by-Tracking and Tracking-by-Learning-Semantic-Scene, Xuan Song, Xiaowei Shao, Huijing Zhao, Jinshi Cui, Ryosuke Shibasaki, Hongbin Zha
- 17. Tracking People Interacting with Objects, Hedvig Kjellström, Danica Kragić, Michael J. Black
- Real Time Motion Capture using a Single Time-Of-Flight Camera, Varun Ganapathi, Christian Plagemann, Daphne Koller, Sebastian Thrun

1340-1520 Sparsity & Convex Optimisation + Applications spotlights

(Ballrooms B-C)

Chair - Bill Freeman (MIT)

Oral Papers (15 min. + 2 min. for questions)

- RASL: Robust Alignment by Sparse and Low-rank Decomposition for Linearly Correlated Images, Yigang Peng, Arvind Ganesh, John Wright, Wenli Xu, Yi Ma
- Efficient Computation of Robust Low-Rank Matrix
 Approximations in the Presence of Missing Data using the
 L₁ Norm, Anders Eriksson, Anton van den Hengel
- On the Design of Robust Classifiers for Computer Vision, Hamed Masnadi-Shirazi, Vijay Mahadevan, Nuno Vasconcelos
- 4. Online-Batch Strongly Convex Multi Kernel Learning, Francesco Orabona, Luo Jie, Barbara Caputo

- Efficient Joint 2D and 3D Palmprint Matching with Alignment Refinement, Wei Li, Lei Zhang, David Zhang, Guangming Lu, Jingqi Yan
- Harvesting Large-Scale Weakly-Tagged Image Databases from the Web, Jianping Fan, Yi Shen, Ning Zhou, Yuli Gao
- Visual Recognition using Mappings that Replicate Margins, Lior Wolf, Nathan Manor

Tuesday, June 15 (Afternoon)

Program

- 8. An Eye for an Eye: A Single Camera Gaze-Replacement Method, Lior Wolf, Ziv Freund, Shai Avidan
- Ink-Bleed Reduction Using Functional Minimization, Grani
 A. Hanasusanto, Zheng Wu, Michael S. Brown
- Action Classification on Product Manifolds, Yui Man Lui, J. Ross Beveridge, Michael Kirby
- 11. Motion Fields to Predict Play Evolution in Dynamic Sport Scenes, Kihwan Kim, Matthias Grundmann, Ariel Shamir, Iain Matthews, Jessica Hodgins, Irfan Essa
- SPEC Hashing: Similarity Preserving Algorithm for Entropy-based Coding, Ruei-Sung Lin, David A. Ross, Jay Yagnik
- 13. Shape-based Similarity Retrieval of Doppler Images for Clinical Decision Support, Tanveer Syeda-Mahmood, Pavan Turaga, David Beymer, Fei Wang, Arnon Amir, Hayit Greenspan, Kilian Pohl
- 14. Real-Time Vehicle Global Localisation with a Single Camera in Dense Urban Areas: Exploitation of Coarse 3D City Models, Pierre Lothe, Steve Bourgeois, Eric Royer, Michel Dhome, Sylvie Naudet Collette
- 15. Taxonomic Classification for Web-based Videos, Yang Song, Ming Zhao, Jay Yaqnik, Xiaoyun Wu
- 16. YouTubeCat: Learning to Categorize Wild Web Videos, Zheshen Wang, Ming Zhao, Yang Song, Sanjiv Kumar, Baoxin Li
- 17. Covering Trees and Lower-bounds on Quadratic Assignment, Julian Yarkony, Charless Fowlkes, Alexander Ihler
- Efficient Piecewise Learning for Conditional Random Fields, Karteek Alahari, Chris Russell, Philip H. S. Torr

1520-1540 Afternoon Break

1540-1720 Object Recognition II: Using Language (Ballroom A)

Chair – Ales Leonardis (*Univ. of Ljubljana*)

Oral Papers (15 min. + 2 min. for questions)

 Multimodal Semi-supervised Learning for Image Classification, Matthieu Guillaumin, Jakob Verbeek, Cordelia Schmid

- What Helps Where And Why? Semantic Relatedness for Knowledge Transfer, Marcus Rohrbach, Michael Stark, György Szarvas, Iryna Gurevych, Bernt Schiele
- Towards Semantic Embedding in Visual Vocabulary, Rongrong Ji, Hongxun Yao, Xiaoshuai Sun, Bineng Zhong, Wen Gao

- Exploiting Monge Structures in Optimum Subwindow Search, Senjian An, Patrick Peursum, Wanquan Liu, Svetha Venkatesh, Xaioming Chen
- Unified Real-Time Tracking and Recognition with Rotation-Invariant Fast Features, Gabriel Takacs, Vijay Chandrasekhar, Sam Tsai, David Chen, Radek Grzeszczuk, Bernd Girod
- Fast Polygonal Integration and Its Application in Extending Haar-like Features to Improve Object Detection, Minh-Tri Pham, Yang Gao, Viet-Dung D. Hoang, Tat-Jen Cham
- Object Detection via Boundary Structure Segmentation, Alexander Toshev, Ben Taskar, Kostas Daniilidis
- 8. Implicit Hierarchical Boosting for Multi-view Object Detection, Xavier Perrotton, Marc Sturzel, Michel Roux
- Connecting Modalities: Semi-supervised Segmentation and Annotation of Images Using Unaligned Text Corpora, Richard Socher, Li Fei-Fei
- 10. Support Vector Regression for Multi-View Gait Recognition based on Local Motion Feature Selection, Worapan Kusakunniran, Qiang Wu, Jian Zhang, Hongdong Li
- 11. Integrated Pedestrian Classification and Orientation Estimation, *Markus Enzweiler, Dariu M. Gavrila*
- 12. Multi-Cue Pedestrian Classification With Partial Occlusion Handling, Markus Enzweiler, Angela Eigenstetter, Bernt Schiele, Dariu M. Gavrila
- Model Globally, Match Locally: Efficient and Robust 3D Object Recognition, Bertram Drost, Markus Ulrich, Nassir Navab, Slobodan Ilic
- 14. Visual Recognition and Detection Under Bounded Computational Resources, Sudheendra Vijayanarasimhan, Ashish Kapoor

- 15. Talking Pictures: Temporal Grouping and Dialog-Supervised Person Recognition, Timothee Cour, Benjamin Sapp, Akash Nagle, Ben Taskar
- An Efficient Divide-and-Conquer Cascade for Nonlinear Object Detection, Christoph H. Lampert
- New Features and Insights for Pedestrian Detection, Stefan Walk, Nikodem Majer, Konrad Schindler, Bernt Schiele
- 18. Efficient Rotation Invariant Object Detection using Boosted Random Ferns, Michael Villamizar, Francesc Moreno-Noguer, Juan Andrade-Cetto, Alberto Sanfeliu
- 19. Fast and Robust Object Segmentation with the Integral Linear Classifier, David Aldavert, Arnau Ramisa, Ramon Lopez de Mantaras, Ricardo Toledo
- 20. Segmenting Video Into Classes of Algorithm-Suitability, Oisin Mac Aodha, Gabriel J. Brostow, Marc Pollefeys
- 21. Latent Hierarchical Structural Learning for Object Detection, Long Zhu, Yuanhao Chen, Alan Yuille, William T. Freeman
- 22. A Steiner Tree Approach to Efficient Object Detection, Olga Russakovsky, Andrew Y. Ng
- 23. Cascaded Pose Regression, Piotr Dollár, Peter Welinder, Pietro Perona
- 24. Free-Shape Subwindow Search for Object Localization, Zhiqi Zhang, Yu Cao, Dhaval Salvi, Kenton Oliver, Jarrell Waqqoner, Sonq Wanq
- 25. Improving Web Image Search Results using Query-relative Classifiers, Josip Krapac, Moray Allan, Jakob Verbeek, Frédéric Jurie

1540-1720 Shape from X (Ballrooms B-C)

Chair – Todd Zickler (*Harvard Univ.*)

Oral Papers (15 min. + 2 min. for questions)

- Using Cloud Shadows to Infer Scene Structure and Camera Calibration, Nathan Jacobs, Brian Bies, Robert Pless
- Depth from Diffusion, Changyin Zhou, Oliver Cossairt, Shree Nayar
- Self-calibrating Photometric Stereo, Boxin Shi, Yasuyuki Matsushita, Yichen Wei, Chao Xu, Ping Tan

- Geometric Properties of Multiple Reflections in Catadioptric Camera with Two Planar Mirrors, Xianghua Ying, Kun Peng, Ren Ren, Hongbin Zha
- Recovering Thin Structures via Nonlocal-Means Regularization with Application to Depth from Defocus, Paolo Favaro
- Upsampling Range Data in Dynamic Environments, Jennifer Dolson, Jongmin Baek, Christian Plagemann, Sebastian Thrun
- Object Cut: Complex 3D Object Reconstruction Through Line Drawing Separation, Tianfan Xue, Jianzhuang Liu, Xiaoou Tang
- 8. Consensus Photometric Stereo, Tomoaki Higo, Yasuyuki Matsushita, Katsushi Ikeuchi
- Model Evolution: An Incremental Approach to Non-Rigid Structure from Motion, Shengqi Zhu, Li Zhang, Brandon M. Smith
- 3D Shape Scanning with a Time-of-Flight Camera, Yan Cui, Sebastian Schuon, Derek Chan, Sebastian Thrun, Christian Theobalt
- Refinement of Digital Elevation Models from Shadowing Cues, James Hogan, William A. P. Smith
- 12. Simultaneous Pose, Correspondence and Non-Rigid Shape, Jordi Sánchez-Riera, Jonas Östlund, Pascal Fua, Francesc Moreno-Noguer
- 13. Surface Extraction from Binary Volumes with Higher-Order Smoothness, Victor Lempitsky
- 14. A Framework for Ultra High Resolution 3D Imaging, Zheng Lu, Yu-Wing Tai, Moshe Ben-Ezra, Michael S. Brown
- 15. 3D Reconstruction of Glossy Surfaces Using Stereo Cameras and Projector-Display, Masaki Yamazaki, Gang Xu
- Simultaneous Point Matching and 3D Deformable Surface Reconstruction, Appu Shaji, Aydin Varol, Lorenzo Torresani, Pascal Fua
- Shape and Refractive Index Recovery from Single-View Polarisation Images, Cong Phuoc Huynh, Antonio Robles-Kelly, Edwin Hancock
- 18. High-Resolution Modeling of Moving and Deforming Objects Using Sparse Geometric and Dense Photometric Measurements, Yi Xu, Daniel G. Aliaga

- Specular Surface Reconstruction from Sparse Reflection Correspondences, Aswin C. Sankaranarayanan, Ashok Veeraraghavan, Oncel Tuzel, Amit Agrawal
- 20. Single Image Depth Estimation From Predicted Semantic Labels, Beyang Liu, Stephen Gould, Daphne Koller
- 21. Robust Piecewise-Planar 3D Reconstruction and Completion from Large-Scale Unstructured Point Data, Anne-Laure Chauve, Patrick Labatut, Jean-Philippe Pons

1720-2100 Demos (location TBA)

- Robot Vision and Manipulation on Willow Garage's PR2, Gary Bradski, Radu Rusu
- P-N Learning: Robust Object Tracking, Zdenek Kalal, Jiří Matas, Krystian Mikolajczyk
- The OpenTL Library for Model-based Visual Tracking, Giorgio Panin, Thorsten Röder, Erwin Roth, Claus Lenz, Suraj Nair, Sebastian Klose, Thomas Müller, Thomas Friedlhuber, Martin Wojtczyk, Alois Knoll
- Aggregating Descriptors to Index 10 Million Images (On My Laptop), Hervé Jégou, Matthijs Douze, Cordelia Schmid, Patrick Pérez
- Google Image Swirl, Yushi Jing, Henry Rowley, Ming Zhao, Chuck Rosenberg, Jingbin Wang
- 6. Real-time Polarizaiton Imaging at 1 Megapixel Resolution, Timothy York, Rob Perkins, Viktor Gruev
- Audio-Visual Panoramas, Adam E. O'Donovan, Ramani Duraiswami
- 8. No demo assigned to this station.
- CUDA-based Implementations of Softassign and EM-ICP, Toru Tamaki, Miho Abe, Bisser Raytchev, Kazufumi Kaneda, Marcos Slomp
- 10. IBM Smart Surveillance System, Rogerio Feris, Lisa Brown, Quanfu Fan, Ankur Datta, Sharathchandra Pankanti, Arun Hampapur, Yun Zhai, Russell Bobbitt, Rick Kjeldsen, Chiaofe Shu, Stephen Russo, Chris Milite
- 11. Unified Tracking and Recognition with Rotation-Invariant Fast Features, Gabriel Takacs, Sam Tsai, Radek Grzeszczuk, Ramakrishna Vedantham, Bernd Girod
- 12. Practical Real-Time Hand-Tracking, Robert Y Wang, Jovan Popovic

1720-2100 Tuesday Poster Session (location TBA)

All papers (oral and poster) with presentations on Tuesday.

Catered food stations provided.

Wednesday, June 16

0700-0830 Breakfast

0700-1800 Registration (Garden Room)

0800-2000 Exhibits

· See Tuesday morning Exhibits

0830-1010 Motion & Tracking II (Ballroom A)

Chair - Ivan Laptev (INRIA)

Oral Papers (15 min. + 2 min. for questions)

- Visual Tracking Decomposition, Junseok Kwon, Kyoung Mu Lee
- A Globally Optimal Data-Driven Approach for Image Distortion Estimation, Yuandong Tian, Srinivasa G. Narasimhan
- Tracking the Invisible: Learning Where the Object Might be, Helmut Grabner, Jiří Matas, Luc Van Gool, Philippe Cattin
- Motion Detail Preserving Optical Flow Estimation, Li Xu, Jiaya Jia, Yasuyuki Matsushita

Poster Spotlights (90 seconds each)

- Modeling Pixel Process with Scale Invariant Local Patterns for Background Subtraction in Complex Scenes, Shengcai Liao, Guoying Zhao, Vili Kellokumpu, Matti Pietikäinen, Stan Z. Li
- Real-time Tracking of Multiple Occluding Objects using Level Sets, Charles Bibby, Ian Reid
- Visual Tracking via Incremental Self-tuning Particle Filtering on the Affine Group, Min Li, Wei Chen, Kaiqi Huang, Tieniu Tan
- Visual Tracking via Weakly Supervised Learning from Multiple Imperfect Oracles, Bineng Zhong, Hongxun Yao, Sheng Chen, Rongrong Ji, Xiaotong Yuan, Shaohui Liu, Wen Gao
- Warping Background Subtraction, Teresa Ko, Stefano Soatto, Deborah Estrin
- 10. Free-Form Mesh Tracking: a Patch-Based Approach, Cedric Cagniart, Edmond Boyer, Slobodan Ilic

- 11. Trajectory Matching from Unsynchronized Videos, Han Hu, Jie Zhou
- 12. Rapid Selection of Reliable Templates for Visual Tracking, Nicolas Alt, Stefan Hinterstoisser, Nassir Navab
- Generalized Simultaneous Registration and Segmentation, Pratim Ghosh, Mehmet Emre Sargin, B. S. Manjunath
- 14. A Probabilistic Framework for Joint Segmentation and Tracking, Chad Aeschliman, Johnny Park, Avinash C. Kak
- Probabilistic 3D Occupancy Flow with Latent Silhouette Cues, Li Guan, Jean-Sébastien Franco, Edmond Boyer, Marc Pollefeys
- 16. Novel Observation Model for Probabilistic Object Tracking, Dawei Liang, Qingming Huang, Hongxun Yao, Shuqiang Jiang, Rongrong Ji, Wen Gao
- Online Multiple Instance Learning with No Regret, Mu Li, James T. Kwok, Bao-Liang Lu
- Dynamic Surface Matching by Geodesic Mapping for 3D Animation Transfer, Tony Tung, Takashi Matsuyama

0830-1010 Stereo & Structure from Motion I (Ballrooms B-C)

Chair - Olga Veksler (*Univ. of Western Ontario*)

Oral Papers (15 min. + 2 min. for questions)

- Probabilistic Temporal Inference on Reconstructed 3D Scenes, Grant Schindler, Frank Dellaert
- Piecewise Planar and Non-Planar Stereo for Urban Scene Reconstruction, David Gallup, Jan-Michael Frahm, Marc Pollefeys
- Disambiguating Visual Relations Using Loop Constraints, Christopher Zach, Manfred Klopschitz, Marc Pollefeys

- Towards Internet-scale Multi-view Stereo, Yasutaka Furukawa, Brian Curless, Steve M. Seitz, Richard Szeliski
- Reconstruction of Display and Eyes from a Single Image, Dirk Schnieders, Xingdou Fu, Kwan-Yee K. Wong
- 6. Outlier Removal Using Duality, Carl Olsson, Anders Eriksson, Richard Hartley
- A Constant-Space Belief Propagation Algorithm for Stereo Matching, Qingxiong Yang, Liang Wang, Narendra Ahuja

Program

- 8. Evaluation of Stereo Confidence Indoors and Outdoors, Xiaoyan Hu, Philippos Mordohai
- Pushing the Envelope of Modern Methods for Bundle Adjustment, Yekeun Jeong, David Nister, Drew Steedly, Richard Szeliski, In So Kweon
- Quasi-Dense 3D Reconstruction using Tensor-based Multiview Stereo, Tai-Pang Wu, Sai-Kit Yeung, Jiaya Jia, Chi-keung Tang
- Accurate 3D Face Reconstruction from Weakly Calibrated Wide Baseline Images with Profile Contours, Yuping Lin, Gérard Medioni, Jongmoo Choi
- 12. Live Dense Reconstruction with a Single Moving Camera, Richard A. Newcombe, Andrew J. Davison
- Multi-View Scene Flow Estimation: A View Centered Variational Approach, Tali Bahsa, Yael Moses, Nahum Kiryati
- 14. Egomotion using Assorted Features, Vivek Pradeep, Jongwoo Lim
- 15. Monocular SLAM with Locally Planar Landmarks via Geometric Rao-Blackwellized Particle Filtering on Lie Groups, Junghyun Kwon, Kyoung Mu Lee
- Ray Markov Random Fields for Image-Based 3D Modeling: Model and Efficient Inference, Shubao Liu, David B. Cooper
- 3D Curve Sketch: Flexible Curve-Based Stereo Reconstruction and Calibration, Ricardo Fabbri, Benjamin Kimia
- 18. Scalable Active Matching, Ankur Handa, Margarita Chli, Hauke Strasdat, Andrew J. Davison
- 19. Triangulation Made Easy, Peter Lindstrom
- 20. Simultaneous Surveillance Camera Calibration and Foothead Homology Estimation from Human Detections, Branislav Micusik, Tomas Pajdla
- 21. Surface Stereo with Soft Segmentation, Michael Bleyer, Carsten Rother, Pushmeet Kohli
- 22. Admissible Linear Map Models of Linear Cameras, Guillaume Batog, Xavier Goaoc, Jean Ponce
- 23. Exploiting Global Connectivity Constraints for Reconstruction of 3D Line Segments from Images, Arjun Jain, Christian Kurz, Thorsten Thormählen, Hans-Peter Seidel
- 24. Improving the Efficiency of Hierarchical Structure-and-Motion, Riccardo Gherardi, Michela Farenzena, Andrea Fusiello

25. Multiview Constraints in Frequency Space and Camera Calibration from Unsynchronized Images, Hiroki Matsumoto, Jun Sato, Fumihiko Sakaue

1010-1030 Morning Break

1030–1210 Object Recognition III: Similar Shapes (Ballroom A)

Chair - Lihi Zelnick-Manor (Technion)

Oral Papers (15 min. + 2 min. for questions)

- Common Visual Pattern Discovery via Spatially Coherent Correspondences, Hairong Liu, Shuicheng Yan
- Unsupervised Detection and Segmentation of Identical Objects, Minsu Cho, Young Min Shin, Kyoung Mu Lee
- A Novel Riemannian Framework for Shape Analysis of 3D Objects , Sebastian Kurtek, Eric Klassen, Zhaohua Ding, Anuj Srivastava
- Global and Efficient Self-Similarity for Object Classification and Detection, Thomas Deselaers, Vittorio Ferrari Poster Spotlights (90 seconds each)
- Object Matching with a Locally Affine-Invariant Constraint, Hongsheng Li, Edward Kim, Xiaolei Huang, Lei He
- 6. Unsupervised Learning of Invariant Features Using Video, David Stavens, Sebastian Thrun
- Scale-Hierarchical 3D Object Recognition in Cluttered Scenes, Prabin Bariya, Ko Nishino
- 8. Linked Edges as Stable Region Boundaries, Michael Donoser, Hayko Riemenschneider, Horst Bischof
- Many-to-one Contour Matching for Describing and Discriminating Object Shape, Praveen Srinivasan, Qihui Zhu, Jianbo Shi
- 10. 3D Model Based Vehicle Classification in Aerial Imagery, Saad Khan, Hui Cheng, Dennis Matthies, Harpreet Sawhney
- Multi-View Object Class Detection with a 3D Geometric Model, Joerg Liebelt, Cordelia Schmid
- 12. Fast Directional Chamfer Matching, Ming-Yu Liu, Oncel Tuzel, Ashok Veeraraqhavan, Rama Chellappa
- Scale-invariant Heat Kernel Signatures for Non-rigid Shape Recognition, Michael M. Bronstein, Iasonas Kokkinos
- 14. Object Recognition as Ranking Holistic Figure-Ground Hypotheses, Fuxin Li, João Carreira, Cristian Sminchisescu

- 15. Finding Nemo: Deformable Object Class Modelling using Curve Matching, Mukta Prasad, Andrew Fitzgibbon, Andrew Zisserman, Luc Van Gool
- 16. Automatic Attribution of Ancient Roman Imperial Coins, Ognjen Arandjelović
- Multiple Object Detection by Sequential Monte Carlo and Hierarchical Detection Network, Michal Sofka, Jingdan Zhang, S. Kevin Zhou, Dorin Comaniciu
- 18. Putting Local Features on a Manifold, *Marwan Torki,*Ahmed Elgammal

1030-1210 Statistical Methods & Learning I: Low-Level Vision / Denoising (Ballrooms B-C)

Chair - Martial Herbert (Carnegie Mellon Univ.)

Oral Papers (15 min. + 2 min. for questions)

- A Generative Perspective on MRFs in Low-Level Vision, Uwe Schmidt, Qi Gao, Stefan Roth
- Manifold Blurring Mean Shift Algorithms for Manifold Denoising, Weiran Wang, Miguel Á. Carreira-Perpiñán
- Increasing Depth Resolution of Electron Microscopy of Neural Circuits using Sparse Tomographic Reconstruction, Ashok Veeraraghavan, Alex V. Genkin, Shiv Vitaladevuni, Lou Scheffer, Shan Xu, Harald Hess, Richard Fetter, Marco Cantoni, Graham Knott, Dmitri Chklovskii

Poster Spotlights (90 seconds each)

- SVM for Edge-Preserving Filtering, Qingxiong Yang, Shengnan Wang, Narendra Ahuja
- Modeling and Estimating Persistent Motion with Geometric Flows, Dahua Lin, Eric Grimson, John Fisher
- Robust Video Denoising using Low Rank Matrix Completion, Hui Ji, Chaoqiang Liu, Zuowei Shen, Yuhong Xu
- Personalization of Image Enhancement, Sing Bing Kang, Ashish Kapoor, Dani Lischinski
- 8. Adaptive Linear Predictors for Real-Time Tracking, Stefan Holzer, Slobodan Ilic, Nassir Navab
- Transform Coding for Fast Approximate Nearest Neighbor Search in High Dimensions, Jonathan Brandt
- 10. Multilinear Pose and Body Shape Estimation of Dressed Subjects from Image Sets, Nils Hasler, Hanno Ackermann, Bodo Rosenhahn, Thorsten Thormählen, Hans-Peter Seidel

- Linear View Synthesis Using a Dimensionality Gap Light Field Prior, Anat Levin, Fredo Durand
- 12. Multi-Target Tracking of Time-varying Spatial Patterns,

 Jingchen Liu, Yanxi Liu
- Abrupt Motion Tracking via Adaptive Stochastic Approximation Monte Carlo Sampling, Xiuzhuang Zhou, Yao Lu
- 14. Boosting for Transfer Learning with Multiple Sources, Yi Yao, Gianfranco Doretto
- Energy Minimization for Linear Envelope MRFs, Pushmeet Kohli, M. Pawan Kumar
- 16. Unified Graph Matching in Euclidean Spaces, Julian J. McAuley, Teófilo de Campos, Tibério S. Caetano
- On-line Semi-supervised Multiple-Instance Boosting, Bernhard Zeisl, Christian Leistner, Amir Saffari, Horst Bischof
- Robust RVM Regression Using Sparse Outlier Model, Kaushik Mitra, Ashok Veeraraghavan, Rama Chellappa
- Parametric Dimensionality Reduction by Unsupervised Regression, Miguel Á. Carreira-Perpiñán, Zhengdong Lu
- Spherical Embeddings for non-Euclidean Dissimilarities, Richard C. Wilson, Edwin R. Hancock, Elzbieta Pekalska, Robert Duin
- 21. Moving Vistas: Exploiting Motion for Describing Scenes, Nitesh Shroff, Pavan Turaga, Rama Chellappa
- 22. Part and Appearance Sharing: Recursive Compositional Models for Multi-View Multi-Object Detection, Long Zhu, Yuanhao Chen, Antonio Torralba, William T. Freeman, Alan Yuille
- 23. Randomized Hybrid Linear Modeling by Local Best-fit Flats, Teng Zhang, Arthur Szlam, Yi Wang, Gilad Lerman
- 24. Improving State-of-the-Art OCR through High-Precision Document-Specific Modeling, Andrew Kae, Gary Huang, Carl Doersch, Erik Learned-miller
- 25. Discriminative Clustering for Image Co-segmentation, Armand Joulin, Francis Bach, Jean Ponce

1225-1325 PAMI TC Meeting (Ballrooms A-C)

Lunch boxes provided.

1340-1520 Video Analysis & Event Recognition (Ballroom A)

Chair - David Fleet (Univ. of Toronto)

Oral Papers (15 min. + 2 min. for questions)

- What's going on? Discovering Spatio-Temporal Dependencies in Dynamic Scenes, Daniel Kuettel, Michael D. Breitenstein, Luc Van Gool, Vittorio Ferrari
- Visual Event Recognition in Videos by Learning from Web Data, Lixin Duan, Dong Xu, Ivor Wai-Hung Tsang, Jiebo Luo
- Temporal Causality for the Analysis of Visual Events, Karthir Prabhakar, Sangmin Oh, Ping Wang, Gregory D. Abowd, James M. Rehg
- 4. Anomaly Detection in Crowded Scenes, Vijay Mahadevan, Weixin Li, Viral Bhalodia, Nuno Vasconcelos

Poster Spotlights (90 seconds each)

- Illumination Compensation Based Change Detection
 Using Order Consistency, Vasu Parameswaran, Maneesh
 Singh, Visvanathan Ramesh
- Efficient Action Spotting Based on a Spacetime Oriented Structure Representation, Konstantinos G. Derpanis, Mikhail Sizintsev, Kevin Cannons, Richard P. Wildes
- Cross-Dataset Action Detection, Liangliang Cao, Zicheng Liu, Thomas S. Huang
- Learning 3D Action Models from a Few 2D Videos for View Invariant Action Recognition, Pradeep Natarajan, Vivek Kumar Singh, Ram Nevatia
- Exploiting Simple Hierarchies for Unsupervised Human Behavior Analysis, Fabian Nater, Helmut Grabner, Luc Van Gool
- Clustering Dynamic Textures with the Hierarchical EM Algorithm, Antoni B. Chan, Emanuele Coviello, Gert R. G. Lanckriet
- Recognizing Human Actions from Still Images with Latent Poses, Weilong Yang, Yang Wang, Greg Mori
- 12. Group Motion Segmentation Using a Spatio-Temporal Driving Force Model, *Ruonan Li, Rama Chellappa*
- Learning a Hierarchy of Discriminative Space-Time Neighborhood Features for Human Action Recognition, Adriana Kovashka, Kristen Grauman

- 14. Chaotic Invariants of Lagrangian Particle Trajectories for Anomaly Detection in Crowded Scenes, Shandong Wu, Brian E. Moore, Mubarak Shah
- 15. A Hough Transform-Based Voting Framework for Action Recognition, Angela Yao, Juergen Gall, Luc Van Gool
- Scene Understanding by Statistical Modeling of Motion Patterns, Imran Saleemi, Lance Hartung, Mubarak Shah
- 17. Spike Train Driven Dynamical Models for Human Actions, Michalis Raptis, Kamil Wnuk, Stefano Soatto

1340-1520 Segmentation & Grouping I: Low Level (Ballrooms B-C)

Chair - Charless Fowlkes (UC Irvine)

Oral Papers (15 min. + 2 min. for questions)

- Parallel and Distributed Graph Cuts by Dual Decomposition, Petter Strandmark, Fredrik Kahl
- Object Separation In X-Ray Image Sets, Geremy Heitz, Gal Chechik
- Learning Full Pairwise Affinities for Spectral Segmentation, Tae Hoon Kim, Kyoung Mu Lee, Sang Uk Lee
- 4. Isoperimetric Cut on a Directed Graph, Mo Chen, Ming Liu, Jianzhuang Liu, Xiaoou Tang

Poster Spotlights (90 seconds each)

- "Lattice Cut" Constructing Superpixels using Layer Constraints, Alastair P. Moore, Simon J. D. Prince, Jonathan Warrell
- 6. A Diffusion Approach to Seeded Image Segmentation, Juyong Zhang, Jianmin Zheng, Jianfei Cai
- Discrete Minimum Ratio Curves and Surfaces, Fred Nicolls, Philip H. S. Torr
- Efficient Hierarchical Graph-Based Video Segmentation, Matthias Grundmann, Vivek Kwatra, Mei Han, Irfan Essa
- A Spatially Varying PSF-based Prior for Alpha Matting, Christoph Rhemann, Carsten Rother, Pushmeet Kohli, Margrit Gelautz
- Simultaneous Foreground, Background, and Alpha Estimation for Image Matting, Brian L. Price, Bryan S. Morse, Scott Cohen
- 11. Fast Matting Using Large Kernel Matting Laplacian Matrices, *Kaiming He, Jian Sun, Xiaoou Tang*

Wednesday, June 16 (Afternoon)

Program

- 12. Fast Approximate Energy Minimization with Label Costs, Andrew Delong, Anton Osokin, Hossam N. Isack, Yuri Boykov
- Parallel Graph-cuts by Adaptive Bottom-up Merging, Jiangyu Liu, Jian Sun
- 14. Transductive Segmentation of Live Video with Nonstationary Background, Fan Zhong, Xueying Qin, Qunsheng Peng
- 15. Morphological Snakes, Luis Álvarez, Luis Baumela, Pedro Henríquez, Pablo Márquez-Neila
- 16. Co-clustering of Image Segments Using Convex Optimization Applied to EM Neuronal Reconstruction, Shiv N. Vitaladevuni, Ronen Basri
- 17. Multi-domain, Higher Order Level Set Scheme for 3D Image Segmentation on the GPU, Ojaswa Sharma, Qin Zhang, François Anton, Chandrajit Bajaj
- 18. A Study on Continuous Max-Flow and Min-Cut Approaches, *Jing Yuan, Egil Bae, Xuecheng Tai*

1520-1540 Afternoon Break

1540-1720 Object Recognition IV (Ballroom A)

Chair – Silvio Savarese (*Univ. of Michigan*)
Oral Papers (15 min. + 2 min. for questions)

- Object Recognition by Discriminative Combinations of Line Segments and Ellipses, Alex Yong-Sang Chia, Susanto Rahardja, Deepu Rajan, Maylor Karhang Leung
- On Detection of Multiple Object Instances using Hough Transforms, Olga Barinova, Victor Lempitsky, Pushmeet Kohli
- Cascade Object Detection with Deformable Part Models, Pedro F. Felzenszwalb, Ross B. Girshick, David McAllester
- Food Recognition Using Statistics of Pairwise Local Features, Shulin Yang, Mei Chen, Dean Pomerleau, Rahul Sukthankar

Poster Spotlights (90 seconds each)

- Dominant Orientation Templates for Real-Time Detection of Texture-Less Objects, Stefan Hinterstoisser, Vincent Lepetit, Slobodan Ilic, Pascal Fua, Nassir Navab
- 6. The Multiscale Competitive Code via Sparse Representation for Palmprint Verification, Wangmeng Zuo, Zhouchen Lin, Zhenhua Guo, David Zhang
- Learning a Probabilistic Model Mixing 3D and 2D
 Primitives for View Invariant Object Recognition, Wenze Hu, Song-Chun Zhu
- 8. Dense Interest Points, Tinne Tuytelaars
- Two Perceptually Motivated Strategies for Shape Classification, Andrew Temlyakov, Brent C. Munsell, Jarrell W/ Waggoner, Song Wang
- Large-Scale Image Categorization with Explicit Data Embedding, Florent Perronnin, Jorge Sánchez, Yan Liu
- Probabilistic Models for Supervised Dictionary Learning, Xiao-Chen Lian, Zhiwei Li, Changhu Wang, Bao-liang Lu, Lei Zhang
- 12. Use Bin-Ratio Information for Category and Scene Classification, Nianhua Xie, Haibin Ling, Weiming Hu, Xiaoqin Zhang
- Learning Weights for Codebook in Image Classification and Retrieval, Hongping Cai, Fei Yan, Krystian Mikolajczyk
- 14. The Role of Features, Algorithms and Data in Visual Recognition, *Devi Parikh*, *C. Lawrence Zitnick*
- Global Gaussian Approach for Scene Categorization Using Information Geometry, Hideki Nakayama, Tatsuya Harada, Yasuo Kuniyoshi
- 16. Asymmetric Region-to-Image Matching for Comparing Images with Generic Object Categories, Jaechul Kim, Kristen Grauman
- Attribute-Centeric Recognition for Cross-category Generalization, Ali Farhadi, Ian Endres, Derek Hoiem
- Person Re-Identification by Symmetry-Driven Accumulation of Local Features, Michela Farenzena, Loris Bazzani, Alessandro Perina, Vittorio Murino, Marco Cristani

1540–1720 Early & Biologically-inspired Vision (Ballrooms B-C)

Chair - TBD

Oral Papers (15 min. + 2 min. for questions)

- 1. Measuring Visual Saliency by Site Entropy Rate, Wei Wang, Yizhou Wang, Qingming Huang, Wen Gao
- Context-Aware Saliency Detection, Stas Goferman, Lihi Zelnik-Manor, Ayellet Tal
- Minimum Length in the Tangent Bundle as a Model for Curve Completion, Guy Ben-Yosef, Ohad Ben-Shahar Poster Spotlights (90 seconds each)
- 4. Removing Rolling Shutter Wobble, Simon Baker, Eric Bennett, Sing Bing Kang, Richard Szeliski
- Super Resolution using Edge Prior and Single Image Detail Synthesis, Yu-Wing Tai, Shuaicheng Liu, Michael S. Brown, Stephen Lin
- Coded Exposure Imaging for Projective Motion Deblurring, Yu-Wing Tai, Naejin Kong, Stephen Lin, Sung Yong Shin
- DARTs: Efficient scale-space extraction of DAISY keypoints, David Marimon, Arturo Bonnin, Tomasz Adamek, Roger Gimeno
- Generating Sharp Panoramas from Motion-blurred Videos, Yunpeng Li, Sing Bing Kang, Neel Joshi, Steve M. Seitz, Daniel P. Huttenlocher
- Secrets of Optical Flow Estimation and Their Principles, Deging Sun, Stefan Roth, Michael J. Black
- Robust Flash Deblurring, Shaojie Zhuo, Dong Guo, Terence Sim
- Recovering Fluid-type Motions Using Navier-Stokes
 Potential Flow, Feng Li, Liwei Xu, Philippe Guyenne, Jingyi
 Yu
- 12. Sparsity Model for Robust Optical Flow Estimation at Motion Discontinuities, *Xiaohui Shen, Ying Wu*
- Motion Estimation with Non-Local Total Variation Regularization, Manuel Werlberger, Thomas Pock, Horst Bischof
- 14. Robust Classification of Objects, Faces, and Flowers Using Natural Image Statistics, Christopher Kanan, Garrison Cottrell
- 15. Fast Image Alignment in the Fourier Domain, Ahmed Bilal Ashraf, Simon Lucey, Tsuhan Chen

- 16. Boundary Learning by Optimization with Topological Constraints, Viren Jain, Benjamin Bollmann, Mark Richardson, Daniel R. Berger, Moritz H. Helmstaedter, Kevin L. Briggman, Winfried Denk, Jared B. Bowden, John M. Mendenhall, Wickliffe C. Abraham, Kristen M. Harris, Narayanan Kasthuri, Ken J. Hayworth, Richard Schalek, Juan Carlos Tapia, Jeff W. Lichtman, H. Sebastian Seung
- 17. Beyond Trees: MRF Inference via Outer-Planar Decomposition, *Dhruv Batra, Andrew C. Gallagher, Devi* Parikh, Tsuhan Chen
- Optical Flow Estimation with Adaptive Convolution Kernel Prior on Discrete Framework, Kyong Joon Lee, Dongjin Kwon, Il Dong Yun, Sang Uk Lee
- 19. Analyzing Spatially-varying Blur, Ayan Chakrabarti, Todd Zickler, William T. Freeman
- 20. Highly Accurate Boundary Detection and Grouping, lasonas Kokkinos
- 21. Deconvolutional Networks, Matthew D. Zeiler, Dilip Krishnan, Graham W. Taylor, Rob Fergus
- 22. Diffusion Filtering Without Parameter Tuning: Models and Inference Tools, *Kai Krajsek, Hanno Scharr*
- 23. Visual Object Tracking using Adaptive Correlation Filters, David S. Bolme, J. Ross Beveridge, Bruce A. Draper, Yui Man Lui
- 24. Modeling Pixel Means and Covariances Using Factorized Third-Order Boltzmann Machines, Marc'Aurelio Ranzato, Geoffrey E. Hinton
- 25. Learning Mid-Level Features For Recognition, *Y-Lan Boureau, Francis Bach, Yann LeCun, Jean Ponce*

1720-2100 Demos (location TBA)

- Real-Time Wide Area Visual SLAM, Brian Clipp, Jan-Michael Frahm, Marc Pollefeys, Jongwoo Lim
- OpenScan: Using Computer Vision to Achieve Transparency in Elections, Kai Wang, Eric Rescorla, Hovav Shacham, Serge Belongie
- 3. OpenCV on NVidia Steriods, Gary Bradski, Vadim Pisarevsky, Victor Eruhimov, Joseph Stam
- 4. A DSP-based Video Content Analysis System, *James Black, Boghos Boghossian*

Wednesday, June 16 (Afternoon)

- User Guided MRI Segmentation: Balancing User Interaction and Automatic Segmentation, Neil Birkbeck, Howard Chung, Dana Cobzas, Martin Jagersand, Parisa Mosayebi, Albert Murtha, Vickie Baracos
- Mobile Visual Search, Linking Printed Documents to Digital Media, Xu Liu, Jonathan J. Hull, Jamey Graham, Jorge Moraleda, Timothée Bailloeul
- Armchair Interface: Computer Vision for General HCI, Daniel Schlegel, Jeffrey Delmerico, Advised by: Jason Corso
- Tracking and Recognition on a Hand-held, Taehee Lee, Stefano Soatto
- Retinal Vessel Calibre Measurement: A Semi-automatic Approach, Alauddin Bhuiyan, Ryo Kawasaki, Tien Wong, Rao Kotagiri
- 10. Demonstration: Dominant Orientation Templates for Real-Time Detection of Texture-Less Objects, Stefan Hinterstoisser, Vincent Lepetit, Slobodan Ilic, Pascal Fua, Nassir Navab
- 11. MOBIO: Mobile Biometric Face and Speaker Authentication, Sébastien Marcel, Cosmin Atanasoaei, Chris McCool, Jan Pešán, Matejka Pavel, Mika Helistekangas, Markus Turtinen
- 12. Intelligent Wheelchair (IW) Interface using Face and Mouth Recognition, Jin Sun Ju, Eun Yi Kim

1720-2100 Wednesday Poster Session (location TBA)

All papers (oral and poster) with presentations on Wednesday.

Catered food stations provided.

2100-2300 Live Entertainment

(location TBA)

Provided by SO3 (http://facebook.com/so3music) and special guests..

Thursday, June 17

0700-0830 Breakfast

0700–1800 Registration (Garden Room)

0800-2000 Exhibits

See Tuesday morning Exhibits

0830-1010 Face & Gesture Analysis (Ballroom A)

Chair – Massimo Tistarelli (*Università degli Studi di* Sassari)

Oral Papers (15 min. + 2 min. for questions)

- Face Recognition Based on Image Sets, Hakan Cevikalp, Bill Triggs
- Unsupervised Discovery of Facial Events, Feng Zhou, Fernando De la Torre, Jeffrey F. Cohn
- 3D Morphable Model Construction for Robust Ear and Face Recognition, John D. Bustard, Mark S. Nixon
 - Poster Spotlights (90 seconds each)
- 4. Bimodal Gender Recognition from Face and Fingerprint, Xiong Li, Xu Zhao, Yun Fu, Yuncai Liu
- Towards General Motion-Based Face Recognition, Ning Ye, Terence Sim
- Morphable Reflectance Fields for Enhancing Face Recognition, Ritwik Kumar, Michael Jones, Tim K. Marks
- Removal of 3D Face Expressions: A Learning-based Approach, Gang Pan, Song Han, Zhaohui Wu, Yuting Zhang
- 8. Multi-Task Warped Gaussian Process for Personalized Age Estimation, Yu Zhang, Dit-Yan Yeung
- Learning Shift-Invariant Sparse Representation of Actions, Yi Li, Cornelia Fermuller, Yiannis Aloimonos, Hui Ji
- 10. Exploring Facial Expression with Compositional Features, Peng Yang, Qingshan Liu, DimitrisN. Metaxas
- An Extension of Multifactor Analysis for Face Recognition Based on Submanifold Learning, Sung Won Park, Marios Savvides

- 12. Making Specific Features Less Discriminative to Improve Point-based 3D Object Recognition, Edward Hsiao, Alvaro Collet, Martial Hebert
- Cost-Sensitive Subspace Learning for Face Recognition, Jiwen Lu, Yap-Peng Tan
- Calibration-free Gaze Sensing using Saliency Maps, Yusuke Sugano, Yasuyuki Matsushita, Yoichi Sato
- 15. A Novel Markov Random Field Based Deformable Model for Face Recognition, Shu Liao, Albert C. S. Chung
- 16. Pose-Robust Albedo Estimation from a Single Image, Soma Biswas, Rama Chellappa
- 17. Discriminative K-SVD for Dictionary Learning in Face Recognition, *Qiang Zhang, Baoxin Li*
- Adaptive Generic Learning for Face Recognition from a Single Sample per Person, Yu Su, Shiguang Shan, Xilin Chen, wen Gao
- 19. Face Recognition with Learning-based Descriptor, Zhimin Cao, Qi Yin, Xiaoou Tang, Jian Sun
- Automatic Point-based Facial Trait Judgments Evaluation, Mario Rojas, David Masip, Alexander Todorov, Jordi Vitrià
- 21. Bidirectional Relighting for 3D-aided 2D Face Recognition, George Toderici, George Passalis, Stefanos Zafireiou, Georgios Tzimiropoulos, Maria Petrou, Theoharis Theoharis, Ioannis A. Kakadiaris
- 22. Facial Point Detection using Boosted Regression and Graph Models, Michel Valstar, Brais Martinez, Xavier Binefa, Maja Pantic
- 23. Action Unit Detection with Segment-based SVMs, Tomas Simon, Minh Hoai Nguyen, Fernando De la Torre, Jeffrey F. Cohn
- 24. Gesture Recognition by Learning Local Motion Signatures, Mohamed-Bécha Kaâniche, François Brémond
- 25. Rapid Face Recognition Using Hashing, *Qinfeng Shi, Hanxi Li, Chunhua Shen*

0830-1010 Stereo & Structure from Motion II + Medical Image Analysis spotlights (Ballrooms B-C)

Chair - Marc Pollefeys (ETH Zurich)

Oral Papers (15 min. + 2 min. for questions)

- 1. Non-Rigid Structure from Locally-Rigid Motion, *Jonathan Taylor, Allan D. Jepson, Kiriakos N. Kutulakos*
- Bundled Depth-Map Merging for Multi-View Stereo, Jianguo Li, Eric Li, Yurong Chen, Lin Xu, Yimin Zhang
- Multi-View Structure Computation without Explicitly Estimating Motion, Hongdong Li

Poster Spotlights (90 seconds each)

- ABSORB: Atlas Building by Self-Organized Registration and Bundling, Hongjun Jia, Guorong Wu, Qian Wang, Dinggang Shen
- Stratified Learning of Local Anatomical Context for Lung Nodules in CT Images, Dijia Wu, Le Lu, Jinbo Bi, Yoshihisa Shinagawa, Kim Boyer, Arun Krishnan, Marcos Salganicoff
- Delineating Trees in Noisy 2D Images and 3D Image-Stacks, Germán González, Engin Türetken, François Fleuret, Pascal Fua
- Sign Ambiguity Resolution for Phase Demodulation in Interferometry with Application to Prelens Tear Film Analysis, Dijia Wu, Kim L. Boyer
- Multiple Dynamic Models for Tracking the Left Ventricle of the Heart from Ultrasound Data using Particle Filters and Deep Learning Architectures, Gustavo Carneiro, Jacinto C. Nascimento
- Multilinear Feature Extraction and Classification of Multi-Focal Images, With Applications in Nematode Taxonomy, Min Liu, Amit K. Roy-Chowdhury
- Search Strategies for Multiple Landmark Detection by Submodular Maximization, David Liu, Kevin S. Zhou, Dominik Bernhardt, Dorin Comaniciu
- 11. Compression of Surface Registrations using Beltrami Coefficients, Lok Ming Lui, Tsz Wai Wong, Paul Thompson, Tony F Chan, Xianfeng Gu, Shing-Tung Yau
- 12. Natural Gradients for Deformable Registration, *Darko Zikic, Ali Kamen, Nassir Navab*

- 13. Curious Snakes: A Minimum Latency Solution to the Cluttered Background Problem in Active Contours, Ganesh Sundaramoorthi, Stefano Soatto, Anthony J. Yezzi
- 14. Anatomical Parts-Based Regression Using Non-Negative Matrix Factorization, Swapna Joshi, S. Karthikeyan Shanmugavadivel, B.S. Manjunath, Scott Grafton, Kent A. Kiehl
- 15. Metric-Induced Optimal Embedding for Intrinsic 3D Shape Analysis, Rongjie Lai, Yonggang Shi, Kevin Scheibel, Scott Fears, Roger Woods, Arthur W. Toga, Tony F. Chan
- 16. Simultaneous Searching of Globally Optimal Interacting Surfaces with Shape Priors, Qi Song, Xiaodong Wu, Yunlong Liu, Mona Garvin, Milan Sonka
- 17. Group MRF for fMRI Activation Detection, Bernard Ng, Rafeef Abugharbieh, Ghassan Hamarneh
- Localizing Non-Overlapping Surveillance Cameras under the L-Infinity Norm, Branislav Micusik, Roman Pflugfelder
- Neuron Geometry Extraction by Perceptual Grouping in ssTEM Images, Verena Kaynig, Thomas Fuchs, Joachim M. Buhmann
- 20. An Automatic Unsupervised Classification of MR Images in Alzheimer's Disease, *Xiaojing Long, Chris Wyatt*
- 21. Masked FFT Registration, Dirk Padfield
- 22. Lymph Node Detection in 3-D Chest CT using a Spatial Prior Probability, Johannes Feulner, S. Kevin Zhou, Martin Huber, Joachim Hornegger, Comaniciu Dorin, Alexander Cavallaro
- 23. Image Atlas Construction via Intrinsic Averaging on the Manifold of Images, Yuchen Xie, Jeffrey Ho, Baba C. Vemuri
- 24. Heterogeneous Conditional Random Field: Realizing Joint Detection and Segmentation of Cell Regions in Microscopic Images, Jiyan Pan, Takeo Kanade, Mei Chen
- 25. Model-Based Respiratory Motion Compensation for Image-Guided Cardiac Interventions, Matthias Schneider, Hari Sundar, Joachim Hornegger, Chenyang Xu

1010-1030 Morning Break

1030-1210 Object Recognition V (Ballroom A)

Chair - Fei-Fei Li (Stanford)

Oral Papers (15 min. + 2 min. for questions)

- Proximate Sensing: Inferring What-Is-Where From Georeferenced Photo Collections, Daniel Leung, Shawn Newsam
- Detecting Text in Natural Scenes with Stroke Width Transform, Boris Epshtein, Eyal Ofek, Yonatan Wexler
- Reading Between The Lines: Object Localization Using Implicit Cues from Image Tags, Sung Ju Hwang, Kristen Grauman
- Beyond Active Noun Tagging: Modeling Contextual Interactions for Multi-Class Active Learning, Behjat Siddiquie, Abhinav Gupta

Poster Spotlights (90 seconds each)

- ARISTA Image Search to Annotation on Billions of Web Photos, Xin-Jing Wang, Lei Zhang, Ming Liu, Yi Li, Wei-Ying Ma
- Breaking the Interactive Bottleneck in Multi-class
 Classification with Active Selection and Binary Feedback,
 Ajay J. Joshi, Fatih Porikli, Nikolaos Papanikolopoulos
- Efficient Histogram-Based Sliding Window, Yichen Wei, Litian Tao
- 8. Pareto-optimal Dictionaries for Signatures, Michael Calonder, Vincent Lepetit, Pascal Fua
- Region Moments: Fast invariant descriptors for detecting small image structures, Gianfranco Doretto, Yi Yao
- Optimizing One-Shot Recognition with Micro-Set Learning, Kevin D. Tang, Marshall F. Tappen, Rahul Sukthankar, Christoph H. Lampert
- 11. Far-Sighted Active Learning on a Budget for Image and Video Recognition, Sudheendra Vijayanarasimhan, Prateek Jain, Kristen Grauman
- 12. A Square-Root Sampling Approach to Fast Histogram-Based Search, Huang-Wei Chang, Hwann-Tzong Chen
- 13. Fast Pattern Matching using Orthogonal Haar Transform, Wanli Ouyang, Renqi Zhang, Wai-Kuen Cham
- 14. One-Shot Multi-Set Non-rigid Feature-Spatial Matching, Marwan Torki, Ahmed Elgammal
- 15. Relaxing the 3L Algorithm for an Accurate Implicit
 Polynomial Fitting, Mohammad Rouhani, Angel D. Sappa

- Online Visual Vocabulary Pruning Using Pairwise
 Constraints, Pavan Kumar Mallapragada, Rong Jin, Anil K.
 Jain
- Safety in Numbers: Learning Categories from Few Examples with Multi Model Knowledge Transfer, Tatiana Tommasi, Francesco Orabona, Barbara Caputo
- 18. Rapid and Accurate Developmental Stage Recognition of C. elegans from High-throughput Image Data, Amelia G. White, Patricia G. Cipriani, Huey-Ling Kao, Brandon Lees, Davi Geiger, Eduardo Sontag, Kristin C. Gunsalus, Fabio Piano

1030-1210 Segmentation & Grouping II: Semantic Segmentation

(Ballrooms B-C)

Chair - Fernando De la Torre (Carnegie Mellon Univ.)

Oral Papers (15 min. + 2 min. for questions)

- Tiered Scene Labeling with Dynamic Programming, Pedro F. Felzenszwalb, Olga Veksler
- Segmentation of Building Facades Using Procedural Shape Priors, Olivier Teboul, Loïc Simon, Panagiotis Koutsourakis, Nikos Paragios
- Layered Object Detection for Multi-Class Segmentation, Yi Yang, Sam Hallman, Deva Ramanan, Charless Fowlkes Poster Spotlights (90 seconds each)
- Rectification of Figures and Photos in Document Images using Bounding Box Interface, Hyung Il Koo, Nam Ik Cho
- Geodesic Star Convexity for Interactive Image Segmentation, Varun Gulshan, Carsten Rother, Antonio Criminisi, Andrew Blake, Andrew Zisserman
- Figure-Ground Segmentation Improves Handled Object Recognition in Egocentric Video, Xiaofeng Ren, Chunhui Gu
- Learning Kernels for Variants of Normalized Cuts: Convex Relaxations and Applications, Lopamudra Mukherjee, Vikas Singh, Jiming Peng, Chris Hinrichs
- Globally Optimal Pixel Labeling Algorithms for Tree Metrics, Pedro F. Felzenszwalb, Gyula Pap, Éva Tardos, Ramin Zabih
- 9. Geodesic Graph Cut for Interactive Image Segmentation, Brian L. Price, Bryan Morse, Scott Cohen

- 10. iCoseg: Interactive Co-segmentation with Intelligent Scribble Guidance, Dhruv Batra, Adarsh Kowdle, Devi Parikh, Jiebo Luo, Tsuhan Chen
- 11. Variational Segmentation of Elongated Volumetric Structures, Christian Reinbacher, Thomas Pock, Christian Bauer, Horst Bischof
- 12. Collect-Cut: Segmentation with Top-Down Cues Discovered in Multi-Object Images, Yong Jae Lee, Kristen Grauman
- Authority-Shift Clustering: Hierarchical Clustering by Authority Seeking on Graphs, Minsu Cho, Kyoung Mu Lee
- 14. Nonparametric Higher-Order Learning for Interactive Segmentation, *Tae Hoon Kim, Kyoung Mu Lee, Sang Uk Lee*
- 15. GPCA with Denoising: A Moments-Based Convex Approach, Necmiye Ozay, Mario Sznaier, Constantino Lagoa, Octavia Camps
- 16. Efficiently Selecting Regions for Scene Understanding, M. Pawan Kumar, Daphne Koller
- 17. Finding Image Distributions on Active Curves, Ismail Ben Ayed, Amar Mitiche, Mohamed Ben Salah, Shuo Li
- A Shape-Driven MRF Model for the Segmentation of Organs in Medical Images, Deepak R. Chittajallu, Shishir K. Shah, Ioannis A. Kakadiaris
- Constrained Parametric Min-Cuts for Automatic Object Segmentation, João Carreira, Cristian Sminchisescu
- 20. Towards Weakly Supervised Semantic Segmentation by Means of Multiple Instance and Multitask Learning., Alexander Vezhnevets, Joachim M. Buhmann
- 21. Fast Global Optimization of Curvature, Noha Youssry El-Zehiry, Leo Grady
- 22. Label Propagation in Video Sequences, Vijay Badrinarayanan, Fabio Galasso, Roberto Cipolla
- 23. Vessel Scale Selection using MRF Optimization, Hengameh Mirzaalian, Ghassan Hamarneh
- 24. Harmony Potentials for Joint Classification and Segmentation, Josep M. Gonfaus Sitjes, Xavier Boix Bosch, Joost Van de Weijer, Andrew D. Bagdanov, Joan Serrat Gual, Jordi Gonzalez Sabaté
- 25. Graph Cut Segmentation with a Global Constraint: Recovering Region Distribution via a Bound of the Bhattacharyya Measure, Ismail Ben Ayed, Hua-mei Chen, Kumaradevan Punithakumar, Ian Ross, Shuo Li

1210-1340 Lunch on your own

1210-1340 Encyclopedia of Computer Vision Board Meeting (meet at Springer exhibit) (by invitation only)

1210–1340 CVPR 2010 Organizers Luncheon (13 View Lounge) (by invitation only)

1340-1520 Image & Video Retrieval (Ballroom A)

Chair - Harpreet Sawhney (Sarnoff Corp.)

Oral Papers (15 min. + 2 min. for questions)

- Interest Seam Image, Xiao Zhang, Gang Hua, Lei Zhang, Heung-Yeung Shum
- Aggregating Local Descriptors into a Compact Image Representation, Hervé Jégou, Matthijs Douze, Cordelia Schmid, Patrick Pérez
- Automatic Image Annotation Using Group Sparsity, Shaoting Zhang, Junzhou Huang, Yuchi Huang, Yang Yu, Hongsheng Li, Dimitris N. Metaxas

Poster Spotlights (90 seconds each)

- Nonparametric Label-to-Region by Search, Xiaobai Liu, Shuicheng Yan, Jiebo Luo, Jinhui Tang, Zhongyang Huang, Hai Jin
- CRAM: Compact Representation of Actions in Movies, Mikel Rodriguez
- Building and Using a Semantivisual Image Hierarchy, Li-Jia Li, Chong Wang, Yongwhan Lim, David M. Blei, Li Fei-Fei
- Weakly-Supervised Hashing in Kernel Space, Yadong Mu, Jialie Shen, Shuicheng Yan
- 8. Spatial-Bag-of-Features, Yang Cao, Changhu Wang, Zhiwei Li, Liqing Zhang, Lei Zhang
- Locality-constrained Linear Coding for Image Classification, Jinjun Wang, Jianchao Yang, Kai Yu, Fengjun Lv, Thomas S. Huang, Yihong Gong
- 10. Semantic Context Modeling with Maximal Margin Conditional Random Fields for Automatic Image Annotation, Yu Xiang, Xiangdong Zhou, Zuotao Liu, Tat-Seng Chua, Chong-Wah Ngo
- Image Retrieval via Probabilistic Hypergraph Ranking, Yuchi Huang, Qingshan Liu, Shaoting Zhang, Dimitris N. Metaxas
- 12. Large-Scale Image Retrieval with Compressed Fisher Vectors, Florent Perronnin, Yan Liu, Jorge Sánchez, Hervé Poirier
- 13. Optimizing kd-trees for Scalable Visual Descriptor Indexing, You Jia, Jingdong Wang, Gang Zeng, Hongbin Zha, Xian-Sheng Hua

- 14. Content-Aware Ranking for Visual Search, *Bo Geng, Linjun Yang, Chao Xu, Xian-Sheng Hua*
- 15. Topic Regression Multi-Modal Latent Dirichlet Allocation for Image Annotation, Duangmanee Putthividhya, Hagai T. Attias, Srikantan S. Nagarajan
- 16. Unsupervised Discovery of Co-occurrence in Sparse High Dimensional Data, *Ondřej Chum, Jiří Matas*
- 17. Semi-Supervised Hashing for Scalable Image Retrieval, Jun Wang, Sanjiv Kumar, Shih-Fu Chang
- 18. Image Webs: Computing and Exploiting Connectivity in Image Collections, Kyle Heath, Natasha Gelfand, Maks Ovsjanikov, Mridul Aanjaneya, Leonidas J. Guibas
- Tag-based Web Photo Retrieval Improved by Batch Mode Re-Tagging, Lin Chen, Dong Xu, Ivor Wai-Hung Tsang, Jiebo Luo
- 20. Finding Meaning on YouTube: Tag Recommendation and Category Discovery, George Toderici, Hrishikesh Aradhye, Marius Pasca, Luciano Sbaiz, Jay Yagnik
- Discovering Scene Categories by Information Projection and Cluster Sampling, Dengxin Dai, Tianfu Wu, Song-Chun Zhu
- 22. Total Bregman Divergence and its Applications to Shape Retrieval, Meizhu Liu, Baba C. Vemuri, Shun-ichi Amari, Frank Nielsen
- 23. Scalable Face Image Retrieval with Identity-Based Quantization and Multi-Reference Re-ranking, Zhong Wu, Qifa Ke, Jian Sun, Heung-Yeung Shum
- 24. Compact Projection: Simple and Efficient Near Neighbor Search with Practical Memory Requirements, Kerui Min, Linjun Yang, John Wright, Lei Wu, Xian-Sheng Hua, Yi Ma
- 25. SUN Database: Large Scale Scene Recognition from Abbey to Zoo, Jianxiong Xiao, James Hays, Krista A. Ehinger, Aude Oliva, Antonio Torralba

1340-1520 Statistical Methods & Learning II: Sparse Coding / Feature Spaces (Ballrooms B-C)

Chair - Yann LeCun (New York Univ.)

Oral Papers (15 min. + 2 min. for questions)

- Visual Classification with Multi-Task Joint Sparse Representation, Xiao-Tong Yuan, Shuicheng Yan
- Classification and Clustering via Dictionary Learning with Structured Incoherence and Shared Features, Ignacio Ramirez, Pablo Sprechmann, Guillermo Sapiro
- The Automatic Design of Feature Spaces for Local Image Descriptors using an Ensemble of Non-linear Feature Extractors, Gustavo Carneiro
- 4. Supervised Translation-Invariant Sparse Coding, *Jianchao Yang, Kai Yu, Thomas S. Huang*

Poster Spotlights (90 seconds each)

- Comparative Object Similarity for Improved Recognition with Few or No Examples, Gang Wang, David Forsyth, Derek Hoiem
- Bayes Optimal Kernel Discriminant Analysis, Di You, Aleix M. Martinez
- Efficient Additive Kernels via Explicit Feature Maps, Andrea Vedaldi, Andrew Zisserman
- Data Driven Mean-Shift Belief Propagation For non-Gaussian MRFs, Minwoo Park, Somesh Kashyap, Robert T. Collins, Yanxi Liu
- Local Features Are Not Lonely Laplacian Sparse Coding for Image Classification, Shenghua Gao, Ivor Wai-Hung Tsang, Liang-Tien Chia, Peilin Zhao
- 10. Factorization Towards a Classifier, *Qiang Chen, Shuicheng*Yan, Tian-Tsong Ng
- 11. Online Multi-Class LPBoost, Amir Saffari, Martin Godec, Thomas Pock, Christian Leistner, Horst Bischof
- 12. Sparse Representation using Nonnegative Curds and Whey, Yanan Liu, Fei Wu, Zhihua Zhang, Yueting Zhuang, Shuicheng Yan
- Multi-Structure Model Selection via Kernel Optimisation, Tat-Jun Chin, David Suter, Hanzi Wang
- 14. Data Fusion through Cross-modality Metric Learning using Similarity-Sensitive Hashing, Michael M. Bronstein, Alexander M. Bronstein, Fabrice Michel, Nikos Paragios

- 15. Pareto Discriminant Analysis, Karim T. Abou-Moustafa, Fernando De la Torre, Frank P. Ferrie
- Sufficient Dimension Reduction for Visual Sequence Classification, Alex Shyr, Raquel Urtasun, Michael I. Jordan
- 17. Fast Sparse Representation with Prototypes, *Jia-Bin Huang, Ming-Hsuan Yang*
- 18. I_p Norm Multiple Kernel Fisher Discriminant Analysis for Object and Image Categorisation, Fei Yan, Krystian Mikolajczyk, Mark Barnard, Hongping Cai, Josef Kittler

1520-1540 Afternoon Break

1520-1730 Demos (location TBA)

- Dense Reconstruction from Millions of Images on a Single PC, Jan-Michael Frahm, Pierre Fite Georgel, David Gallup, Tim Johnson, Rahul Raguram, Changchang Wu, Yi-Hung Jen, Enrique Dunn, Brian Clipp, Svetlana Lazebnik, Marc Pollefeys
- 2. A Visual Navigation using Color and Texture, *Jin Sun Ju, Eun Yi Kim*
- 3. Live Dense Reconstruction with a Single Moving Camera, Richard A. Newcombe, Andrew J. Davison
- Fast and Robust Object Segmentation with the Integral Linear Classifier, David Aldavert, Arnau Ramisa, Ramon Lopez de Mantaras, Ricardo Toledo
- Understanding Multidimensional Biological Images -- An Automatic Classification and Annotation Framework, Jie Zhou, Hanchuan Peng
- 6. A Practical and Robust System for Object Detection and Pose Estimation in Heavy Clutter using Active Illumination, Yuichi Taguchi, Ming-Yu Liu, Oncel Tuzel, Ashok Veeraraghavan, Amit Agrawal, Tim K. Marks, Srikumar Ramalingam, Nitesh Shroff, Ramesh Raskar, John Barnwell, Jay Thornton, Keisuke Kojima
- Video-based, Real-Time Multi-view Stereo, George Vogiatzis, Carlos Hernández Estaban
- 8. No demo assigned to this slot.
- A Film Restoration System using Neural Network and Genetic Algorithm, Kyung-tai Kim, Byunggeun Kim, Eun Yi Kim

Thursday, June 17 (Afternoon)

- 10. YoutubeCat: Categorizing Wild Youtube Videos, Ming Zhao, Yang Song, Reto Strobl, Zheshen Wang, Sanjiv Kumar, Xiaoyun Wu, Jay Yagnik, Baoxin Li
- 11. I-See-You: Robust Recognition of Facial Expressions and Speech Prosody in Real Time, Mohammed E. Hoque, Rosalind W. Picard
- 12. Real Time Lightfield Rendering Using GPUs, Andrew Lumsdaine, Todor Georgiev, Georgi Chunev

1520–1730 Thursday Poster Session (location TBA)

All papers (oral and poster) with presentations on Thursday.

Friday, June 18

0700-0830 Breakfast

0700-1800 Registration (Garden Room)

Projector-Camera Systems (PROCAMS)

Organizers: Srinivasa Narasimhan

Li Zhang

Location: Seacliff A (1st Floor)

Schedule: Full day

0900 Welcome

og10 **Keynote Talk 1:** Some Recent Progress in Hemispherical Electronic Eye Cameras and Related Devices, *John Rogers (Univ. of Illinois at Urbana-Champaign)*

1000 Morning Break

S1: Systems and Applications (1030-1120)

- 1030 Dynamic Projection Environments for Immersive Visualization, Theodore C. Yapo, Yu Sheng, Joshua Nasman, Andrew Dolce, Eric Li, Barbara Cutler
- 1055 Interactive Display of Image Details using a Cameracoupled Mobile Projector, Jiyoung Park, Myoung-Hee Kim

S2: Poster Fast Forward (1120—1130) & Poster Session (1130—1230)) — Posters will be in Ballroom

- Precomputed ROMP for Light Transport Acquisition, Satoshi Yamamoto, Yasumasa Itakura, Masashi Sawabe, Gimpei Okada, Norimichi Tsumura, Toshiya Nakaguchi
- Appearance Control by Projector Camera Feedback for Visually Impaired, Toshiyuki Amano, Hirokazu Kato
- Absolute Phase Mapping for One-shot Dense Pattern Projection, Sergio Fernandez, Joaquim Salvi, Tomislav Pribanic

- Projector Optical Distortion Calibration Using Gray
 Code Patterns, Samuel Jordan, Michael Greenspan
- A Graph-Based Approach for Robust Single-Shot
 Structured Light, Christoph Schmalz, Elli Angelopoulou
- Selection of Temporally Dithered Codes for Increasing Virtual Depth of Field in Structured Light Systems, Ricardo R. Garcia, Avideh Zakhor
- Contrasting Shadow for Occluder Light Suppression from One-Shot Image, Yoshiko Sugaya, Isao Miyagawa, Hideki Koike
- One-shot Scanning Method using an Uncalibrated Projector and Camera System, Hiroshi Kawasaki, Ryusuke Sagawa, Yasushi Yagi, Ryo Furukawa, Naoki Asada, Peter Sturm

1230 Lunch Break

1400 **Keynote Talk 2:** The Future of Light and Lighting, Kevin Dowling (MC10 Inc)

S3: Color and Appearance (1440-1530)

- 1440 Display Gamut Reshaping for Color Emulation and Balancing, Aditi Majumder, Robert G. Brown, Hussein S. El-Gloroury
- 1505 Physically-based Augmentation of Real Objects with Virtual Content under the Influence of Ambient Light, Christoffer Menk, Reinhard Koch

1530 Afternoon Break

1600 Keynote Talk 3: Projectors and Cameras for High Dynamic Range Imaging, Wolfgang Heidrich (Univ. of British Columbia)

S4: Matching and Calibration (1650–1740)

- 1650 Camera-Projector Matching Using an Unstructured Video Stream, Marc-Antoine Drouin, Pierre-Marc Jodoin, Julien Prémont
- 1715 Device-Independent Representation of Photometric Properties of a Camera, Maxim Lazarov, Aditi Majumder
- 1740 Concluding Remarks

Biometrics

Organizers: Bir Bhanu

Nalini K. Ratha Venu Govindaraju

Location: Regency (Main Floor)

Schedule: Full day

0825 Welcome and Opening Remarks

S1: Finger and Hand (0830-0915)

- o83o Complex Spectral Minutiae Representation For Fingerprint Recognition, *Haiyun Xu, Raymond N. J. Veldhuis*
- o845 On the Utility of Extended Fingerprint Features: A Study on Pores, *Qijun Zhao*, *Anil K. Jain*
- ogoo Human Hand Identification with 3D Hand Pose Variations, *Vivek Kahangad, Ajay Kumar, David Zhang*

S2: Iris (0920-0955)

- og2o Similarity of Iris Texture between Identical Twins,

 Karen Hollingsworth, Kevin W. Bowyer, Patrick J. Flynn
- oggs Block Based Texture Analysis for Iris Classification and Matching, *Arun Ross, Manisha Sam Sunder*

1000 Morning Break

1030 Invited Talk: TBA

S3: Fusion (1140-1225)

- 1140 Group-specific Score Normalization for Biometric Systems, Norman Poh, Josef Kittler, Ajita Rattani, Massimo Tistarelli
- 1155 QPLC: A Novel Multimodal Biometric Score Fusion Method, Jayanta Basak, Kiran Kate, Vivek Tyagi, Nalini Ratha
- 1210 Improving Biometric Identification Through Qualitybased Face and Fingerprint Biometric Fusion, Yan Tong, Frederick W. Wheeler, Xiaoming Liu
- 1215 Redundancy and Diversity Measure Inspired Biometrics Fusion, Veshnu Ramakrishnan, Nalini Ratha

1220 Scenario-Based Score Fusion for Face Recognition at a Distance, Pedro Tome, Julian Fierrez, Fernando Alonso-Fernandez, Javier Ortega-Garcia

1230 Lunch Break

S4: Face (1400-1430)

- 1400 Quantifying How Lighting and Focus Affect Face Recognition Performance, J. Ross Beveridge, David S. Bolme, Bruce A. Draper, Geof H. Givens, Yui Man Lui, P. Jonathon Phillips
- 1415 FACE-GRAB: Face Recognition with General Region Assigned to Binary Operator, Archana Sapkota, Brian Parks, Walter Scheirer, Terrance Boult

S5: Soft Biometrics (1440-1525): 50 minutes

- 1440 Ordinary Preserving Manifold Analysis for Human Age Estimation, *Jiwen Lu*, *Yap-Peng Tan*
- 1455 Boosting Dense SIFT Descriptors and Shape Contexts of Face Images for Gender Recognition, Jian-Gang Wang, Jun Li, Wei-Yun Yau, Eric Sung
- 1500 Spectral Regression based Age Determination, Khoa Luu, Tien Dai Bui, Ching Y. Suen, Karl Ricanek Jr.
- 1505 Ethnicity Classification Based on Gait Using Multiview Fusion, *De Zhana*, Yunhong Wana, Bir Bhanu
- 1520 Spatio-Temporal Alignment and Hyperspherical Radon Transform for 3D Gait Recognition in Multiview Environments, Cristian Canton-Ferrer, Josep R. Casas, Montse Pardàs

1530 Afternoon Break

S6: Systems (1600-1635)

- 1600 Occlusion Detection for ICAO Compliant Facial Photographs, Markus Storer, Martin Urschler, Horst Bischof
- 1605 Learning from Summaries of Videos: Applying Batch Mode Active Learning to Face-based Biometrics, Shayok Chakraborty, Vineeth Balasubramanian, Sethuraman Panchanathan
- 1610 Obtaining Cryptographic Keys Using Feature Level
 Fusion of Iris and Face Biometrics for Secure User

- Authentication, Sanjay Kanade, Dijana Petrovska-Delacrétaz, Bernadette Dorizzi
- 1615 Handling High Dimensionality in Biometric Classification with Multiple Quality Measures using Locality Preserving Projection, Krzysztof Kryszczuk, Norman Poh
- 1620 Illumination Invariant Representation for Privacy Preserving Face Identification, Boaz Moskovich, Margarita Osadchy

S7: Novel Biometrics (1645-1725)

- 1645 Periocular Region Appearance Cues for Biometric Identification, *Damon L. Woodard, Shrinivas J. Pundlik, Jamie R. Lyle, Philip E. Miller*
- 1700 Respiratory Rate Estimation via Simultaneously Tracking and Segmentation, Jianchao Yao, Yap-Peng Tan, Yaying Lin
- 1715 HERO: Human Ear Recognition against Occlusions,
 Maria De Marsico, Michele Nappi, Daniel Riccio
- 1725 Closing Remarks

International Workshop on Mobile Vision (IWMV)

Organizers: Zhengyou Zhang

Marc Pollefeys Gang Hua Yun Fu Matthew Turk

Location: Pacific Concourse L-M (Basement)

Schedule: Full day 0830 Opening Remarks

o835 **Keynote Talk:** Mobile Computational Photography, Kari Pulli (Nokia Research Center)

S1: Mobile Augmented and Mixed Reality (0920–1010)

og2o Server-side object recognition and client-side object tracking for mobile augmented reality, *Stephan*

- Gammeter, Alexander Gassmann, Lukas Bossard, Till Quack, Luc Van Gool
- og45 Location-based augmented reality on mobile phones, Rémi Paucher, Matthew Turk

1010 Morning Break

S2: Mobile Visual Search and Recognition (1030-1145)

- 1030 Instant Segmentation and Feature Extraction for Recognition of Simple Objects on Mobile Phones, Andreas Hartl, Clemens Arth, Dieter Schmalstieg
- Mobile Image Search With Multimodal Context-Aware Queries, Xin Yang, Sydney Pang, Tim Cheng
- 1120 Quantization Schemes for Low Bitrate Compressed Histogram of Gradient Descriptors, Vijay Chandrasekhar, Yuriy Reznik, Gabriel Takacs, David Chen, Sam Tsai, Radek Grzeszczuk, Bernd Girod
- 1145 **Keynote Talk:** The Vision Technologies in Google Goggles, *Hartmut Neven (Google Research)*

1230 Lunch Break

1400 Keynote Talk: Reality Matters for Augmented Reality Gaming, Blair MacIntyre (Geogia Institute of Technology)

S3: Mobile Computational Photography (1445–1535)

- 1445 Removing Motion Blur from Barcode Images, Saeed Yahyanejad, Jacob Strom
- 1510 Fast Image Stitching and Editing for Panorama Painting on Mobile Phones, Yingen Xiong, Kari Pulli

1535 Afternoon Break

S4: Mobile and Internet Vision, and Other (1600-1650)

- 1600 Removing pedestrians from Google Street View images, *Arturo Flores, Serge Belongie*
- 1625 A Step Towards Self-calibration in SLAM: Weakly Calibrated On-line Structure and Motion Estimation, Sebastian Haner, Anders Heyden
- 1650 Award Announcement
- S5: Potential Demo Session (1710-1800)

CVPR for Human Communicative Behaviour Analysis (CVPR4HB)

Organizers: Maja Pantic

Jeffrey Cohn Matthew Turk Thomas S. Huang

Location: Seacliff B (1st Floor)

Schedule: Full day
ogoo Opening Remarks

S1: Keynote Session 1 (0915-1000)

og15 **Keynote:** Grammars of Human Activity, *Yiannis Aloimonos (Univ. of Maryland)*

1000 Morning Break

S2: Oral Session 1 (1015-1200)

- 1015 Annotation and Taxonomy of Gestures in Lecture Videos, John R. Zhang, Kuangye Guo, Cipta Herwana, John R. Kender
- 1040 Action Recognition Based on A Bag of 3D Points, Wanqing Li, Zhenqyou Zhanq, Zichenq Liu
- Human Activity Recognition in Video using a Hierarchical Probabilistic Latent Model, Jun Yin, Yan Meng
- 1130 Attention Estimation by Simultaneous Observation of Viewer and View, *Anup Doshi, Mohan Trivedi*

S3: Keynote Session 2 (1200-1245)

1200 Keynote: Audiovisual Human Communicative Behavior Analysis: Interest and Emotional Dimensions, Björn Schuller (Technical Univ. of Munich)

1245 Lunch Break (and Poster Preparation)

S4: Keynote Session 3 (1415-1500)

1415 **Keynote**: 3D Spatiotemporal Facial Behavior Analysis, *Lijun Yin (Birmingham Univ.)*

S5: Poster Session & Afternoon Break (1500–1545)) — Posters will be in Ballroom

- Facial Expression Invariant Head Pose Normalization using Gaussian Process Regression, Ognjen Rudovic, Maja Pantic, Ioannis Patras
- Capturing Appearance Variation in Active Appearance Models, Laurens Van der Maaten, Emile Hendriks
- Facial Expression Recognition Using Gabor Motion Energy Filters, Tingfan Wu, Marian S. Bartlett, Javier R. Movellan
- A Novel Approach to American Sign Language (ASL)
 Phrase Verification using Reversed Signing, Zahoor
 Zafrulla, Helene Brashear, Harley Hamilton, Thad
 Starner
- Hierarchical Preference Learning for Light Control from User Feedback, Amir Hossein Khalili, Chen Wu, Hamid Aqhajan
- Automatic Segmentation of Video to Aid the Study of Faucet Usability for Older Adults, Jasper Snoek, Babak Taati, Yulia Eskin, Alex Mihailidis

S6: Oral Session 2 (1545-1730)

- 1545 Facial Action Unit Detection: 3D versus 2D Modality, Arman Savran, Bülent Sankur, M. Taha Bilge
- 1610 Facial Expressions as Feedback Cue in Human–Robot Interaction — A Comparison between Human and Automatic Recognition Performances, Christian Lang, Sven Wachsmuth, Heiko Wersing, Marc Hanheide
- 1635 Learning Spatial Weighting via Quadratic Programming for Facial Expression Analysis, Chia-Te Liao, Hui-Ju Chuang, Chih-Hsueh Duan, Shang-Hong Lai
- 1700 The Extended Cohn-Kanade Dataset (CK+): A Complete Dataset for Action Unit and Emotionspecified Expression, Patrick Lucey, Jeffrey F. Cohn, Takeo Kanade, Jason Saragih, Zara Ambadar, Iain Matthews

S7: Panel Discussion (1730-1830)

1730 Panelists — Yiannis Aloimonos, Lijun Yin, Bjoern Schuller, Jeffrey Cohn, Thomas Huang, and Maja Pantic; Panel chair — Matthew Turk

1830 Closing

Non-Rigid Shape Analysis and Deformable Image Alignment (NORDIA)

Organizers: Helmut Pottmann

Alexander Bronstein Michael Bronstein

Location: Seacliff C-D (1st Floor)

Schedule: Full day

Workshop program will be provided at CVPR.

Friday, June 18 Tutorials

Semi-Supervised Learning in Vision

Organizers: Amir Saffari

Christian Leistner Horst Bischof

Time: 0830-1230 (Half Day-Morning)

Location: Bayview A (1st Floor)

Description: Current supervised approaches obtain high recognition rates if enough labeled training data is available. However, for most practical problems there is simply not enough labeled data available, whereas hand-labeling is tedious and expensive, in some cases not even feasible. This is especially true for applications in computer vision like object recognition and categorization from images and videos, where the human effort is needed to determine the true contents of the media. Semi-supervised methods offer an interesting solution to this problem by learning from both labeled and unlabeled data. These methods try to give an answer to the question: "How to improve classification accuracy using unlabeled data together with the labeled data?"

This course will cover an introduction to semi-supervised learning, its applications in computer vision, and the open problems and challenges facing the future research in this field. Nowadays, the Internet offers a huge amount of data in form of unlabeled data (or labeled with high degree of uncertainty), and learning from Internet is becoming more and more widespread in computer vision. Therefore, we will have a special focus on issues dealing with large-scale and online semi-supervised learning tasks.

The first half of the course will address the basics of semisupervised learning and its relations to other machine learning domains. It will cover the major works in this field from a unified point of view, and will discuss the advantages and disadvantages of these methods from theoretical and application perspectives. In the second part, we will focus on the applications of the semi-supervised learning in computer vision, and the open challenges and gaps in existing methods.

Scene Reconstruction from Community Photo Collections

Organizers: Michael Goesele

Hendrik P. A. Lensch Noah Snavely

Time: 0830-1230 (Half Day-Morning)

Description: The Internet is an unprecedented source of visual information about our world, and has recently sparked a great deal of interest in computer vision and computer graphics. This short course describes how we can extract geometry and appearance from massive, unstructured Internet collections, through new advances in structure from

Pacific Concourse N-O (Basement)

Course Content

Introduction

Location:

- · Course overview
- Data sources and tools for community photo collections (CPC)

The Photo Tourism system for 3D scene reconstruction

motion, multi-view stereo, and appearance acquisition.

- · Basic reconstruction pipeline
 - -Finding the images
 - -Feature detection and matching
 - -Structure from motion
 - -Essential algorithms for reconstruction
 - -Techniques for robustness and stability
- Optimization techniques for large-scale bundle adjustment
 - -Sparse direct solvers
 - -Conjugate gradient algorithms

Using Photo Tourism to visualize and explore scenes

- Morphing and geometric proxies
- Navigation controls
- Photosynth

Multi-View Stereo (Goesele)

Geometry reconstruction using stereo and multi-view stereo techniques

Friday, June 18 Tutorials

- Reconstruction challenges
- · Multi-view stereo for CPCs
- · Geometry post-processing

Appearance Acquisition (Lensch)

- Introduction to appearance representation and rendering
- · Illumination estimation
- · Reflectance estimation
- Implicit appearance representation

Conclusion

Biometrics: Understanding Advances in Privacy and Security

Organizers: Terry Boult

Walter Scheirer

Time: 0830-1230 (Half Day-Morning)

Location: Marina (1st Floor)

Description: This half-day tutorial will cover recent advances in privacy and security research for biometrics. While we might consider biometrics to be just another useful application of computer vision, the concept of personal identity is important from several perspectives. From a cultural perspective, the more the world converges, the more individual cultures wish to maintain their separate identities. From an individual perspective, the greater the population and the tendency to reduce people to stereotypes, the greater the desire to establish an individual identity. There is, however, another level where identity and the verification of identity, is becoming increasingly important in relation to all manner of transactions, from those related to mobility, to those related to legal, and political, rights and obligations, finally to financial and economical transactions. The intrusion of technology into these areas is not new, but their

heightened visibility and ubiquity can create anxiety. This holds particularly true for biometrics.

The first half of this tutorial will present an overview security and privacy issues with traditional biometrics, introduce the Biometrics Dilemma, various threats it poses and a model for biometric database risk, highlighting the problem with standard large-scale biometrics. The tutorial will explain why standard encryption does not solve the template protection problem, but also explores best practices in using standard encryption that can improve security. Moving to security, the tutorial will examine security system architectures, the role of authentication in such systems and the standard architectures for authentication using biometrics. It will examine the advantages th at biometrics bring, how biometrics can improve security and even privacy in such systems, and then discuss their weakness in both security and privacy. The tutorial will briefly discusses the Nobel prize winning Economic theory of asymmetric information, Akerlof's market for lemons and Kerckhoffs' principles for security, and their implications for biometrics systems, especially large scale deployments.

The second half of this tutorial is an in-depth review of the state of the art in what is sometimes called privacy preserving biometric technologies including biometric encryption, fuzzy vaults, fuzzy extractors, biometric hashing, cancelable biometrics, and revocable bi otokens. Face, fingerprint, and iris systems will be covered in detail. The tutorial will then walk through a security analysis of these technologies including the published attacks. We will also highlight the potential for these emerging privacy enhancing technologies to protect data in "the cloud," as we move toward the routine use of large-scale computing power where the security of data cannot be assured as well as in a local computing site.

The tutorial is intended to be relatively interactive with the opportunity discussion of some of the more subtle issues and a few "exercises" given out during the day with a discussion of the answers later in the day.

Higher Order Models in Computer Vision

Organizers: Carsten Rother

Pushmeet Kohli

Time: 0830-1230 (Half Day-Morning) **Location:** Pacific Concourse H-I (Basement)

Description: Many labelling problems in computer vision such as image restoration, disparity estimation and object recognition are often modelled via Markov Random Fields. Most commonly the model has an underlying simple 4(8)connectivity field. These simple models are very popular, very likely due to the fact that efficient inference (and learning) techniques exist. It is well known that modelling jointly several variables, i.e. higher-order cliques, considerably improve the modelling power and hence the results. The goal of this tutorial is to analyse and categorize various types of different higher-order random field models which have been considered in the past (e.g. patch-based priors, curvature prior, topology prior, etc). The key question for such powerful models is whether efficient and powerful inference techniques exist. This question is the main focus of the tutorial, and we will review recent work which has shown that inference is indeed tractable, by e.g. transforming the higherorder model into a pair-wise one.

We had given a general (full day) tutorial at ICCV og on MAP Inference in Discrete Models. The ICCV tutorial was very general and higher-order models were not really covered. Given recent advances and interest in this field we believe that this tutorial will appeal to a large audience. We hope to inspire many people to use in the future more sophisticated higher-order models.

Mechanical Turk for Computer Vision

Organizers: Alexander Sorokin

Fei-Fei Li

Time: 0830-1230 (Half Day-Morning)

Location: Bayview B (1st Floor)

Description:

This short course will teach how to use Mechanical Turk for a computer vision project. The course will follow the cover these topics:

- 1. Introduction to crowdsourcing
- 2. Tools for crowdsourcing
- 3. Hand-on examples
- 4. Issues in crowdsourcing:
- How to define a task
- How to manage work
- Quality control techniques
- · How much to pay
- 5. Case studies
- 6. Discussion and open issues



