

*Commenced Publication in 1973*

Founding and Former Series Editors:

Gerhard Goos, Juris Hartmanis, and Jan van Leeuwen

Editorial Board

David Hutchison

*Lancaster University, UK*

Takeo Kanade

*Carnegie Mellon University, Pittsburgh, PA, USA*

Josef Kittler

*University of Surrey, Guildford, UK*

Jon M. Kleinberg

*Cornell University, Ithaca, NY, USA*

Alfred Kobsa

*University of California, Irvine, CA, USA*

Friedemann Mattern

*ETH Zurich, Switzerland*

John C. Mitchell

*Stanford University, CA, USA*

Moni Naor

*Weizmann Institute of Science, Rehovot, Israel*

Oscar Nierstrasz

*University of Bern, Switzerland*

C. Pandu Rangan

*Indian Institute of Technology, Madras, India*

Bernhard Steffen

*TU Dortmund University, Germany*

Madhu Sudan

*Microsoft Research, Cambridge, MA, USA*

Demetri Terzopoulos

*University of California, Los Angeles, CA, USA*

Doug Tygar

*University of California, Berkeley, CA, USA*

Gerhard Weikum

*Max Planck Institute for Informatics, Saarbruecken, Germany*

Kostas Daniilidis Petros Maragos  
Nikos Paragios (Eds.)

# Computer Vision – ECCV 2010

11th European Conference on Computer Vision  
Heraklion, Crete, Greece, September 5-11, 2010  
Proceedings, Part V

## Volume Editors

Kostas Daniilidis  
GRASP Laboratory  
University of Pennsylvania  
3330 Walnut Street, Philadelphia, PA 19104, USA  
E-mail: kostas@cis.upenn.edu

Petros Maragos  
National Technical University of Athens  
School of Electrical and Computer Engineering  
15773 Athens, Greece  
E-mail: maragos@cs.ntua.gr

Nikos Paragios  
Ecole Centrale de Paris  
Department of Applied Mathematics  
Grande Voie des Vignes, 92295 Chatenay-Malabry, France  
E-mail: nikos.paragios@ecp.fr

Library of Congress Control Number: 2010933243

CR Subject Classification (1998): I.2.10, I.3, I.5, I.4, F.2.2, I.3.5

LNCS Sublibrary: SL 6 – Image Processing, Computer Vision, Pattern Recognition,  
and Graphics

ISSN 0302-9743  
ISBN-10 3-642-15554-5 Springer Berlin Heidelberg New York  
ISBN-13 978-3-642-15554-3 Springer Berlin Heidelberg New York

This work is subject to copyright. All rights are reserved, whether the whole or part of the material is concerned, specifically the rights of translation, reprinting, re-use of illustrations, recitation, broadcasting, reproduction on microfilms or in any other way, and storage in data banks. Duplication of this publication or parts thereof is permitted only under the provisions of the German Copyright Law of September 9, 1965, in its current version, and permission for use must always be obtained from Springer. Violations are liable to prosecution under the German Copyright Law.

springer.com

© Springer-Verlag Berlin Heidelberg 2010  
Printed in Germany

Typesetting: Camera-ready by author, data conversion by Scientific Publishing Services, Chennai, India  
Printed on acid-free paper 06/3180

## Preface

The 2010 edition of the European Conference on Computer Vision was held in Heraklion, Crete. The call for papers attracted an absolute record of 1,174 submissions. We describe here the selection of the accepted papers:

- Thirty-eight area chairs were selected coming from Europe (18), USA and Canada (16), and Asia (4). Their selection was based on the following criteria: (1) Researchers who had served at least two times as Area Chairs within the past two years at major vision conferences were excluded; (2) Researchers who served as Area Chairs at the 2010 Computer Vision and Pattern Recognition were also excluded (exception: ECCV 2012 Program Chairs); (3) Minimization of overlap introduced by Area Chairs being former student and advisors; (4) 20% of the Area Chairs had never served before in a major conference; (5) The Area Chair selection process made all possible efforts to achieve a reasonable geographic distribution between countries, thematic areas and trends in computer vision.
- Each Area Chair was assigned by the Program Chairs between 28–32 papers. Based on paper content, the Area Chair recommended up to seven potential reviewers per paper. Such assignment was made using all reviewers in the database including the conflicting ones. The Program Chairs manually entered the missing conflict domains of approximately 300 reviewers. Based on the recommendation of the Area Chairs, three reviewers were selected per paper (with at least one being of the top three suggestions), with 99.7% being the recommendations of the Area Chairs. When this was not possible, senior reviewers were assigned to these papers by the Program Chairs, with the consent of the Area Chairs. Upon completion of this process there were 653 active reviewers in the system.
- Each reviewer got a maximum load of eight reviews—in a few cases we had nine papers when re-assignments were made manually because of hidden conflicts. Upon the completion of the reviews deadline, 38 reviews were missing. The Program Chairs proceeded with fast re-assignment of these papers to senior reviewers. Prior to the deadline of submitting the rebuttal by

the authors, all papers had three reviews. The distribution of the reviews was the following: 100 papers with an average score of weak accept and higher, 125 papers with an average score toward weak accept, 425 papers with an average score around borderline.

- For papers with strong consensus among reviewers, we introduced a procedure to handle potential overwriting of the recommendation by the Area Chair. In particular for all papers with weak accept and higher or with weak reject and lower, the Area Chair should have sought for an additional reviewer prior to the Area Chair meeting. The decision of the paper could have been changed if the additional reviewer was supporting the recommendation of the Area Chair, and the Area Chair was able to convince his/her group of Area Chairs of that decision.
- The discussion phase between the Area Chair and the reviewers was initiated once the review became available. The Area Chairs had to provide their identity to the reviewers. The discussion remained open until the Area Chair meeting that was held in Paris, June 5–6. Each Area Chair was paired to a buddy and the decisions for all papers were made jointly, or when needed using the opinion of other Area Chairs. The pairing was done considering conflicts, thematic proximity, and when possible geographic diversity. The Area Chairs were responsible for taking decisions on their papers. Prior to the Area Chair meeting, 92% of the consolidation reports and the decision suggestions had been made by the Area Chairs. These recommendations were used as a basis for the final decisions.
- Orals were discussed in groups of Area Chairs. Four groups were formed, with no direct conflict between paper conflicts and the participating Area Chairs. The Area Chair recommending a paper had to present the paper to the whole group and explain why such a contribution is worth being published as an oral. In most of the cases consensus was reached in the group, while in the cases where discrepancies existed between the Area Chairs' views, the decision was taken according to the majority of opinions.
- The final outcome of the Area Chair meeting, was 38 papers accepted for an oral presentation and 284 for poster. The percentage ratios of submissions/acceptance per area are the following:

Thematic area	# submitted	% over submitted	# accepted	% over accepted	% acceptance in area
Object and Scene Recognition	192	16.4%	66	20.3%	34.4%
Segmentation and Grouping	129	11.0%	28	8.6%	21.7%
Face, Gesture, Biometrics	125	10.6%	32	9.8%	25.6%
Motion and Tracking	119	10.1%	27	8.3%	22.7%
Statistical Models and Visual Learning	101	8.6%	30	9.2%	29.7%
Matching, Registration, Alignment	90	7.7%	21	6.5%	23.3%
Computational Imaging	74	6.3%	24	7.4%	32.4%
Multi-view Geometry	67	5.7%	24	7.4%	35.8%
Image Features	66	5.6%	17	5.2%	25.8%
Video and Event Characterization	62	5.3%	14	4.3%	22.6%
Shape Representation and Recognition	48	4.1%	19	5.8%	39.6%
Stereo	38	3.2%	4	1.2%	10.5%
Reflectance, Illumination, Color	37	3.2%	14	4.3%	37.8%
Medical Image Analysis	26	2.2%	5	1.5%	19.2%

- We received 14 complaints/reconsideration requests. All of them were sent to the Area Chairs who handled the papers. Based on the reviewers' arguments and the reaction of the Area Chair, three papers were accepted—as posters—on top of the 322 at the Area Chair meeting, bringing the total number of accepted papers to 325 or **27.6%**. The selection rate for the 38 orals was **3.2%**. The acceptance rate for the papers submitted by the group of Area Chairs was 39%.
- Award nominations were proposed by the Area and Program Chairs based on the reviews and the consolidation report. An external award committee was formed comprising David Fleet, Luc Van Gool, Bernt Schiele, Alan Yuille, Ramin Zabih. Additional reviews were considered for the nominated papers and the decision on the paper awards was made by the award committee. We thank the Area Chairs, Reviewers, Award Committee Members, and the General Chairs for their hard work and we gratefully acknowledge Microsoft Research for accommodating the ECCV needs by generously providing the CMT Conference Management Toolkit. We hope you enjoy the proceedings.

# Organization

## General Chairs

Argyros, Antonis	University of Crete/FORTH, Greece
Trahanias, Panos	University of Crete/FORTH, Greece
Tziritas, George	University of Crete, Greece

## Program Chairs

Daniilidis, Kostas	University of Pennsylvania, USA
Maragos, Petros	National Technical University of Athens, Greece
Paragios, Nikos	Ecole Centrale de Paris/INRIA Saclay île-de-France, France

## Workshops Chair

Kutulakos, Kyros	University of Toronto, Canada
------------------	-------------------------------

## Tutorials Chair

Lourakis, Manolis	FORTH, Greece
-------------------	---------------

## Demonstrations Chair

Kakadiaris, Ioannis	University of Houston, USA
---------------------	----------------------------

## Industrial Chair

Pavlidis, Ioannis	University of Houston, USA
-------------------	----------------------------

## Travel Grants Chair

Komodakis, Nikos	University of Crete, Greece
------------------	-----------------------------

## Area Chairs

Bach, Francis	INRIA Paris - Rocquencourt, France
Belongie, Serge	University of California-San Diego, USA
Bischof, Horst	Graz University of Technology, Austria
Black, Michael	Brown University, USA
Boyer, Edmond	INRIA Grenoble - Rhône-Alpes, France
Cootes, Tim	University of Manchester, UK
Dana, Kristin	Rutgers University, USA
Davis, Larry	University of Maryland, USA
Efros, Alyosha	Carnegie Mellon University, USA
Fermuller, Cornelia	University of Maryland, USA
Fitzgibbon, Andrew	Microsoft Research, Cambridge, UK
Jepson, Alan	University of Toronto, Canada
Kahl, Fredrik	Lund University, Sweden
Keriven, Renaud	Ecole des Ponts-ParisTech, France
Kimmel, Ron	Technion Institute of Technology, Ireland
Kolmogorov, Vladimir	University College of London, UK
Lepetit, Vincent	Ecole Polytechnique Federale de Lausanne, Switzerland
Matas, Jiri	Czech Technical University, Prague, Czech Republic
Metaxas, Dimitris	Rutgers University, USA
Navab, Nassir	Technical University of Munich, Germany
Nister, David	Microsoft Research, Redmont, USA
Perez, Patrick	THOMSON Research, France
Perona, Pietro	Caltech University, USA
Ramesh, Visvanathan	Siemens Corporate Research, USA
Raskar, Ramesh	Massachusetts Institute of Technology, USA
Samaras, Dimitris	State University of New York - Stony Brook, USA
Sato, Yoichi	University of Tokyo, Japan
Schmid, Cordelia	INRIA Grenoble - Rhône-Alpes, France
Schoerr, Christoph	University of Heidelberg, Germany
Sebe, Nicu	University of Trento, Italy
Szeliski, Richard	Microsoft Research, Redmont, USA
Taskar, Ben	University of Pennsylvania, USA
Torr, Phil	Oxford Brookes University, UK
Torralba, Antonio	Massachusetts Institute of Technology, USA
Tuytelaars, Tinne	Katholieke Universiteit Leuven, Belgium
Weickert, Joachim	Saarland University, Germany
Weinshall, Daphna	Hebrew University of Jerusalem, Israel
Weiss, Yair	Hebrew University of Jerusalem, Israel



## Conference Board

Horst Bischof	Graz University of Technology, Austria
Hans Burkhardt	University of Freiburg, Germany
Bernard Buxton	University College London, UK
Roberto Cipolla	University of Cambridge, UK
Jan-Olof Eklundh	Royal Institute of Technology, Sweden
Olivier Faugeras	INRIA, Sophia Antipolis, France
David Forsyth	University of Illinois, USA
Anders Heyden	Lund University, Sweden
Ales Leonardis	University of Ljubljana, Slovenia
Bernd Neumann	University of Hamburg, Germany
Mads Nielsen	IT University of Copenhagen, Denmark
Tomas Pajdla	CTU Prague, Czech Republic
Jean Ponce	Ecole Normale Superieure, France
Giulio Sandini	University of Genoa, Italy
Philip Torr	Oxford Brookes University, UK
David Vernon	Trinity College, Ireland
Andrew Zisserman	University of Oxford, UK

## Reviewers

Abd-Almageed, Wael	Bahlmann, Claus	Bougleux, Sebastien
Agapito, Lourdes	Baker, Simon	Boult, Terrance
Agarwal, Sameer	Ballan, Luca	Boureau, Y-Lan
Aggarwal, Gaurav	Barbu, Adrian	Bowden, Richard
Ahlberg, Juergen	Barnes, Nick	Boykov, Yuri
Ahonen, Timo	Barreto, Joao	Bradski, Gary
Ai, Haizhou	Bartlett, Marian	Bregler, Christoph
Alahari, Karteek	Bartoli, Adrien	Bremond, Francois
Aleman-Flores, Miguel	Batra, Dhruv	Bronstein, Alex
Aloimonos, Yiannis	Baust, Maximilian	Bronstein, Michael
Amberg, Brian	Beardsley, Paul	Brown, Matthew
Andreetto, Marco	Behera, Ardhendu	Brown, Michael
Angelopoulou, Elli	Beleznai, Csaba	Brox, Thomas
Ansar, Adnan	Ben-ezra, Moshe	Brubaker, Marcus
Arbel, Tal	Berg, Alexander	Bruckstein, Freddy
Arbelaez, Pablo	Berg, Tamara	Bruhn, Andres
Astroem, Kalle	Betke, Margrit	Buisson, Olivier
Athitsos, Vassilis	Bileschi, Stan	Burkhardt, Hans
August, Jonas	Birchfield, Stan	Burschka, Darius
Avraham, Tamar	Biswas, Soma	Caetano, Tiberio
Azzabou, Noura	Blanz, Volker	Cai, Deng
Babenko, Boris	Blaschko, Matthew	Calway, Andrew
Bagdanov, Andrew	Bobick, Aaron	Cappelli, Raffaele

Caputo, Barbara	Domke, Justin	Fua, Pascal
Carreira-Perpinan, Miguel	Donoser, Michael	Fuchs, Martin
Caselles, Vincent	Doretto, Gianfranco	Furukawa, Yasutaka
Cavallaro, Andrea	Douze, Matthijs	Fusiello, Andrea
Cham, Tat-Jen	Draper, Bruce	Gall, Juergen
Chandraker, Manmohan	Drbohlav, Ondrej	Gallagher, Andrew
Chandran, Sharat	Duan, Qi	Gao, Xiang
Chetverikov, Dmitry	Duchenne, Olivier	Gatica-Perez, Daniel
Chiu, Han-Pang	Duric, Zoran	Gee, James
Cho, Taeg Sang	Duygulu-Sahin, Pinar	Gehler, Peter
Chuang, Yung-Yu	Eklundh, Jan-Olof	Genc, Yakup
Chung, Albert C. S.	Elder, James	Georgescu, Bogdan
Chung, Moo	Elgammal, Ahmed	Geusebroek, Jan-Mark
Clark, James	Epshtein, Boris	Gevers, Theo
Cohen, Isaac	Eriksson, Anders	Geyer, Christopher
Collins, Robert	Espuny, Ferran	Ghosh, Abhijeet
Colombo, Carlo	Essa, Irfan	Glocker, Ben
Cord, Matthieu	Farhadi, Ali	Goecke, Roland
Corso, Jason	Farrell, Ryan	Goedeme, Toon
Costen, Nicholas	Favaro, Paolo	Goldberger, Jacob
Cour, Timothee	Fehr, Janis	Goldenstein, Siome
Crandall, David	Fei-Fei, Li	Goldluecke, Bastian
Cremers, Daniel	Felsberg, Michael	Gomes, Ryan
Criminisi, Antonio	Ferencz, Andras	Gong, Sean
Crowley, James	Fergus, Rob	Gorelick, Lena
Cui, Jinshi	Feris, Rogerio	Gould, Stephen
Cula, Oana	Ferrari, Vittorio	Grabner, Helmut
Dalalyan, Arnak	Ferryman, James	Grady, Leo
Darbon, Jerome	Fidler, Sanja	Grau, Oliver
Davis, James	Finlayson, Graham	Grauman, Kristen
Davison, Andrew	Fisher, Robert	Gross, Ralph
de Bruijne, Marleen	Flach, Boris	Grossmann, Etienne
De la Torre, Fernando	Fleet, David	Gruber, Amit
Dedeoglu, Goksel	Fletcher, Tom	Gulshan, Varun
Delong, Andrew	Florack, Luc	Guo, Guodong
Demirci, Stefanie	Flynn, Patrick	Gupta, Abhinav
Demirdjian, David	Foerstner, Wolfgang	Gupta, Mohit
Denzler, Joachim	Foroosh, Hassan	Habbecke, Martin
Deselaers, Thomas	Forssen, Per-Erik	Hager, Gregory
Dhome, Michel	Fowlkes, Charless	Hamid, Raffay
Dick, Anthony	Frahm, Jan-Michael	Han, Bohyung
Dickinson, Sven	Fraundorfer, Friedrich	Han, Tony
Divakaran, Ajay	Freeman, William	Hanbury, Allan
Dollar, Piotr	Frey, Brendan	Hancock, Edwin
	Fritz, Mario	Hasinoff, Samuel

Hassner, Tal	Kamarainen,	Larlus, Diane
Haussecker, Horst	Joni-Kristian	Latecki, Longin Jan
Hays, James	Kamberov, George	Lazebnik, Svetlana
He, Xuming	Kamberova, Gerda	Lee, ChanSu
Heas, Patrick	Kambhamettu, Chandra	Lee, Honglak
Hebert, Martial	Kanatani, Kenichi	Lee, Kyoung Mu
Heibel, T. Hauke	Kanaujia, Atul	Lee, Sang-Wook
Heidrich, Wolfgang	Kang, Sing Bing	Leibe, Bastian
Hernandez, Carlos	Kappes, Jörg	Leichter, Ido
Hilton, Adrian	Kavukcuoglu, Koray	Leistner, Christian
Hinterstoisser, Stefan	Kawakami, Rei	Lellmann, Jan
Hlavac, Vaclav	Ke, Qifa	Lempitsky, Victor
Hoiem, Derek	Kemelmacher, Ira	Lenzen, Frank
Hoogs, Anthony	Khamene, Ali	Leonardis, Ales
Hornegger, Joachim	Khan, Saad	Leung, Thomas
Hua, Gang	Kikinis, Ron	Levin, Anat
Huang, Rui	Kim, Seon Joo	Li, Chunming
Huang, Xiaolei	Kimia, Benjamin	Li, Gang
Huber, Daniel	Kittler, Josef	Li, Hongdong
Hudelot, Celine	Koch, Reinhard	Li, Hongsheng
Hussein, Mohamed	Koeser, Kevin	Li, Li-Jia
Huttenlocher, Dan	Kohli, Pushmeet	Li, Rui
Ihler, Alex	Kokiopoulou, Efi	Li, Ruonan
Ilic, Slobodan	Kokkinos, Iasonas	Li, Stan
Irschara, Arnold	Kolev, Kalin	Li, Yi
Ishikawa, Hiroshi	Komodakis, Nikos	Li, Yunpeng
Isler, Volkan	Konolige, Kurt	Liefeng, Bo
Jain, Prateek	Koschan, Andreas	Lim, Jongwoo
Jain, Viren	Kukelova, Zuzana	Lin, Stephen
Jamie Shotton, Jamie	Kulis, Brian	Lin, Zhe
Jegou, Herve	Kumar, M. Pawan	Ling, Haibin
Jenatton, Rodolphe	Kumar, Sanjiv	Little, Jim
Jermyn, Ian	Kuthirummal, Sujit	Liu, Ce
Ji, Hui	Kutulakos, Kyros	Liu, Jingen
Ji, Qiang	Kweon, In So	Liu, Qingshan
Jia, Jiaya	Ladicky, Lubor	Liu, Tyng-Luh
Jin, Hailin	Lai, Shang-Hong	Liu, Xiaoming
Jogan, Matjaz	Lalonde, Jean-Francois	Liu, Yanxi
Johnson, Micah	Lampert, Christoph	Liu, Yazhou
Joshi, Neel	Landon, George	Liu, Zicheng
Juan, Olivier	Langer, Michael	Lourakis, Manolis
Jurie, Frederic	Langs, Georg	Lovell, Brian
Kakadiaris, Ioannis	Lanman, Douglas	Lu, Le
Kale, Amit	Laptev, Ivan	Lucey, Simon

Luo, Jiebo	Mukaigawa, Yasuhiro	Peleg, Shmuel
Lyu, Siwei	Mulligan, Jane	Perera, A.G. Amitha
Ma, Xiaoxu	Munich, Mario	Perronnin, Florent
Mairal, Julien	Murino, Vittorio	Petrou, Maria
Maire, Michael	Namboodiri, Vinay	Petrovic, Vladimir
Maji, Subhransu	Narasimhan, Srinivasa	Peursum, Patrick
Maki, Atsuto	Narayanan, P.J.	Philbin, James
Makris, Dimitrios	Naroditsky, Oleg	Piater, Justus
Malisiewicz, Tomasz	Neumann, Jan	Pietikainen, Matti
Mallick, Satya	Nevatia, Ram	Pinz, Axel
Manduchi, Roberto	Nicolls, Fred	Pless, Robert
Manmatha, R.	Niebles, Juan Carlos	Pock, Thomas
Marchand, Eric	Nielsen, Mads	Poh, Norman
Marcialis, Gian	Nishino, Ko	Pollefeys, Marc
Marks, Tim	Nixon, Mark	Ponce, Jean
Marszalek, Marcin	Nowozin, Sebastian	Pons, Jean-Philippe
Martinec, Daniel	O'donnell, Thomas	Potetz, Brian
Martinez, Aleix	Obozinski, Guillaume	Prabhakar, Salil
Matei, Bogdan	Odobez, Jean-Marc	Qian, Gang
Mateus, Diana	Odone, Francesca	Quattoni, Ariadna
Matsushita, Yasuyuki	Ofek, Eyal	Radeva, Petia
Matthews, Iain	Ogale, Abhijit	Radke, Richard
Maxwell, Bruce	Okabe, Takahiro	Rakotomamonjy, Alain
Maybank, Stephen	Okatani, Takayuki	Ramanan, Deva
Mayer, Helmut	Okuma, Kenji	Ramanathan, Narayanan
McCloskey, Scott	Olson, Clark	Ranzato, Marc'Aurelio
McKenna, Stephen	Olsson, Carl	Raviv, Dan
Medioni, Gerard	Ommer, Bjorn	Reid, Ian
Meer, Peter	Osadchy, Margarita	Reitmayr, Gerhard
Mei, Christopher	Overgaard, Niels	Ren, Xiaofeng
Michael, Nicholas	Christian	Rittscher, Jens
Micusik, Branislav	Ozuysal, Mustafa	Rogez, Gregory
Minh, Nguyen	Pajdla, Tomas	Rosales, Romer
Mirmehdi, Majid	Panagopoulos,	Rosenberg, Charles
Mittal, Anurag	Alexandros	Rosenhahn, Bodo
Miyazaki, Daisuke	Pandharkar, Rohit	Rosman, Guy
Monasse, Pascal	Pankanti, Sharath	Ross, Arun
Mordohai, Philippos	Pantic, Maja	Roth, Peter
Moreno-Noguer,	Papadopoulo, Theo	Rother, Carsten
Francesc	Parameswaran, Vasu	Rothganger, Fred
Mori, Greg	Parikh, Devi	Rougon, Nicolas
Morimoto, Carlos	Paris, Sylvain	Roy, Sebastien
Morse, Bryan	Patow, Gustavo	Rueckert, Daniel
Moses, Yael	Patras, Ioannis	Ruether, Matthias
Mueller, Henning	Pavlovic, Vladimir	Russell, Bryan

- Russell, Christopher  
 Sahbi, Hichem  
 Stiefelhagen, Rainer  
 Saad, Ali  
 Safari, Amir  
 Salgian, Garbis  
 Salzmänn, Mathieu  
 Sangineto, Enver  
 Sankaranarayanan,  
     Aswin  
 Sapiro, Guillermo  
 Sara, Radim  
 Sato, Imari  
 Savarese, Silvio  
 Savchynskyy, Bogdan  
 Sawhney, Harpreet  
 Scharr, Hanno  
 Scharstein, Daniel  
 Schellewald, Christian  
 Schiele, Bernt  
 Schindler, Grant  
 Schindler, Konrad  
 Schlesinger, Dmitrij  
 Schoenemann, Thomas  
 Schroff, Florian  
 Schubert, Falk  
 Schultz, Thomas  
 Se, Stephen  
 Seidel, Hans-Peter  
 Serre, Thomas  
 Shah, Mubarak  
 Shakhnarovich, Gregory  
 Shan, Ying  
 Shashua, Amnon  
 Shechtman, Eli  
 Sheikh, Yaser  
 Shekhovtsov, Alexander  
 Shet, Vinay  
 Shi, Jianbo  
 Shimshoni, Ilan  
 Shokoufandeh, Ali  
 Sigal, Leonid  
 Simon, Loic  
 Singara,ju, Dheeraaj  
 Singh, Maneesh  
 Singh, Vikas  
 Sinha, Sudipta  
 Sivic, Josef  
 Slabaugh, Greg  
 Smeulders, Arnold  
 Sminchisescu, Cristian  
 Smith, Kevin  
 Smith, William  
 Snaveley, Noah  
 Snoek, Cees  
 Soatto, Stefano  
 Sochen, Nir  
 Sochman, Jan  
 Sofka, Michal  
 Sorokin, Alexander  
 Southall, Ben  
 Souvenir, Richard  
 Srivastava, Anuj  
 Stauffer, Chris  
 Stein, Gideon  
 Streacha, Christoph  
 Sugimoto, Akihiro  
 Sullivan, Josephine  
 Sun, Deqing  
 Sun, Jian  
 Sun, Min  
 Sunkavalli, Kalyan  
 Suter, David  
 Svoboda, Tomas  
 Syeda-Mahmood,  
     Tanveer  
 Süssstrunk, Sabine  
 Tai, Yu-Wing  
 Takamatsu, Jun  
 Talbot, Hugues  
 Tan, Ping  
 Tan, Robby  
 Tanaka, Masayuki  
 Tao, Dacheng  
 Tappen, Marshall  
 Taylor, Camillo  
 Theobalt, Christian  
 Thonnat, Monique  
 Tieu, Kinh  
 Tistarelli, Massimo  
 Todorovic, Sinisa  
 Toreyin, Behcet Ugur  
 Torresani, Lorenzo  
 Torsello, Andrea  
 Toshev, Alexander  
 Trucco, Emanuele  
 Tschumperle, David  
 Tsin, Yanghai  
 Tu, Peter  
 Tung, Tony  
 Turek, Matt  
 Turk, Matthew  
 Tuzel, Oncel  
 Tyagi, Ambrish  
 Urschler, Martin  
 Urtasun, Raquel  
 Van de Weijer, Joost  
 van Gemert, Jan  
 van den Hengel, Anton  
 Vasilescu, M. Alex O.  
 Vedaldi, Andrea  
 Veeraraghavan, Ashok  
 Veksler, Olga  
 Verbeek, Jakob  
 Vese, Luminita  
 Vitaladevuni, Shiv  
 Vogiatzis, George  
 Vogler, Christian  
 Wachinger, Christian  
 Wada, Toshikazu  
 Wagner, Daniel  
 Wang, Chaohui  
 Wang, Hanzi  
 Wang, Hongcheng  
 Wang, Jue  
 Wang, Kai  
 Wang, Song  
 Wang, Xiaogang  
 Wang, Yang  
 Weese, Juergen  
 Wei, Yichen  
 Wein, Wolfgang  
 Welinder, Peter  
 Werner, Tomas  
 Westin, Carl-Fredrik

Wilburn, Bennett  
Wildes, Richard  
Williams, Oliver  
Wills, Josh  
Wilson, Kevin  
Wojek, Christian  
Wolf, Lior  
Wright, John  
Wu, Tai-Pang  
Wu, Ying  
Xiao, Jiangjian  
Xiao, Jianxiong  
Xiao, Jing  
Yagi, Yasushi  
Yan, Shuicheng  
Yang, Fei  
Yang, Jie  
Yang, Ming-Hsuan

Yang, Peng  
Yang, Qingxiong  
Yang, Ruigang  
Ye, Jieping  
Yeung, Dit-Yan  
Yezzi, Anthony  
Yilmaz, Alper  
Yin, Lijun  
Yoon, Kuk Jin  
Yu, Jingyi  
Yu, Kai  
Yu, Qian  
Yu, Stella  
Yuille, Alan  
Zach, Christopher  
Zaid, Harchaoui  
Zelnik-Manor, Lihi  
Zeng, Gang

Zhang, Cha  
Zhang, Li  
Zhang, Sheng  
Zhang, Weiwei  
Zhang, Wenchao  
Zhao, Wenyi  
Zheng, Yuanjie  
Zhou, Jinghao  
Zhou, Kevin  
Zhu, Leo  
Zhu, Song-Chun  
Zhu, Ying  
Zickler, Todd  
Zikic, Darko  
Zisserman, Andrew  
Zitnick, Larry  
Zivny, Stanislav  
Zuffi, Silvia

## Sponsoring Institutions

### Platinum Sponsor

INSTITUT NATIONAL  
DE RECHERCHE  
EN INFORMATIQUE  
ET EN AUTOMATIQUE



### Gold Sponsors



### Silver Sponsors



# Table of Contents – Part V

## Spotlights and Posters W2

Towards Computational Models of the Visual Aesthetic Appeal of Consumer Videos .....	1
<i>Anush K. Moorthy, Pere Obrador, and Nuria Oliver</i>	
Object Recognition Using Junctions .....	15
<i>Bo Wang, Xiang Bai, Xinggang Wang, Wenyu Liu, and Zhuowen Tu</i>	
Using Partial Edge Contour Matches for Efficient Object Category Localization .....	29
<i>Hayko Riemenschneider, Michael Donoser, and Horst Bischof</i>	
Active Mask Hierarchies for Object Detection .....	43
<i>Yuanhao Chen, Long (Leo) Zhu, and Alan Yuille</i>	
From a Set of Shapes to Object Discovery .....	57
<i>Nadia Payet and Sinisa Todorovic</i>	
What Does Classifying More Than 10,000 Image Categories Tell Us? ...	71
<i>Jia Deng, Alexander C. Berg, Kai Li, and Li Fei-Fei</i>	
Modeling and Analysis of Dynamic Behaviors of Web Image Collections .....	85
<i>Gunhee Kim, Eric P. Xing, and Antonio Torralba</i>	
Non-local Characterization of Scenery Images: Statistics, 3D Reasoning, and a Generative Model .....	99
<i>Tamar Avraham and Michael Lindenbaum</i>	
Efficient Highly Over-Complete Sparse Coding Using a Mixture Model .....	113
<i>Jianchao Yang, Kai Yu, and Thomas S. Huang</i>	
Attribute-Based Transfer Learning for Object Categorization with Zero/One Training Example .....	127
<i>Xiaodong Yu and Yiannis Aloimonos</i>	
Image Classification Using Super-Vector Coding of Local Image Descriptors .....	141
<i>Xi Zhou, Kai Yu, Tong Zhang, and Thomas S. Huang</i>	
A Discriminative Latent Model of Object Classes and Attributes .....	155
<i>Yang Wang and Greg Mori</i>	



Seeing People in Social Context: Recognizing People and Social Relationships . . . . . 169  
*Gang Wang, Andrew Gallagher, Jiebo Luo, and David Forsyth*

Discovering Multipart Appearance Models from Captioned Images . . . . . 183  
*Michael Jamieson, Yulia Eskin, Afsaneh Fazly, Suzanne Stevenson, and Sven Dickinson*

Voting by Grouping Dependent Parts . . . . . 197  
*Pradeep Yarlagadda, Antonio Monroy, and Björn Ommer*

Superpixels and Supervoxels in an Energy Optimization Framework . . . . . 211  
*Olga Veksler, Yuri Boykov, and Paria Mehrani*

**Segmentation**

Convex Relaxation for Multilabel Problems with Product Label Spaces . . . . . 225  
*Bastian Goldluecke and Daniel Cremers*

Graph Cut Based Inference with Co-occurrence Statistics . . . . . 239  
*Lubor Ladicky, Chris Russell, Pushmeet Kohli, and Philip H.S. Torr*

Ambrosio-Tortorelli Segmentation of Stochastic Images . . . . . 254  
*Torben Pätz and Tobias Preusser*

Multiple Hypothesis Video Segmentation from Superpixel Flows . . . . . 268  
*Amelio Vazquez-Reina, Shai Avidan, Hanspeter Pfister, and Eric Miller*

Object Segmentation by Long Term Analysis of Point Trajectories . . . . . 282  
*Thomas Brox and Jitendra Malik*

**Spotlights and Posters R1**

Exploiting Repetitive Object Patterns for Model Compression and Completion . . . . . 296  
*Luciano Spinello, Rudolph Triebel, Dizan Vasquez, Kai O. Arras, and Roland Siegwart*

Feature Tracking for Wide-Baseline Image Retrieval . . . . . 310  
*Ameesh Makadia*

Crowd Detection with a Multiview Sampler . . . . . 324  
*Weina Ge and Robert T. Collins*

A Unified Contour-Pixel Model for Figure-Ground Segmentation . . . . . 338  
*Ben Packer, Stephen Gould, and Daphne Koller*

SuperParsing: Scalable Nonparametric Image Parsing with Superpixels . . . . .	352
<i>Joseph Tighe and Svetlana Lazebnik</i>	
Segmenting Salient Objects from Images and Videos . . . . .	366
<i>Esa Rahtu, Juho Kannala, Mikko Salo, and Janne Heikkilä</i>	
ClassCut for Unsupervised Class Segmentation . . . . .	380
<i>Bogdan Alexe, Thomas Deselaers, and Vittorio Ferrari</i>	
A Dynamic Programming Approach to Reconstructing Building Interiors . . . . .	394
<i>Alex Flint, Christopher Mei, David Murray, and Ian Reid</i>	
Discriminative Mixture-of-Templates for Viewpoint Classification . . . . .	408
<i>Chunhui Gu and Xiaofeng Ren</i>	
Efficient Non-consecutive Feature Tracking for Structure-from-Motion . . . . .	422
<i>Guofeng Zhang, Zilong Dong, Jiaya Jia, Tien-Tsin Wong, and Hujun Bao</i>	
P2P: A Minimal Solution for Registration of 3D Points to 3D Planes . . . . .	436
<i>Srikumar Ramalingam, Yuichi Taguchi, Tim K. Marks, and Oncel Tuzel</i>	
Boosting Chamfer Matching by Learning Chamfer Distance Normalization . . . . .	450
<i>Tianyang Ma, Xingwei Yang, and Longin Jan Latecki</i>	
Geometry Construction from Caustic Images . . . . .	464
<i>Manuel Finckh, Holger Dammertz, and Hendrik P.A. Lensch</i>	
Archive Film Restoration Based on Spatiotemporal Random Walks . . . . .	478
<i>Xiaosong Wang and Majid Mirmehdi</i>	
Reweighted Random Walks for Graph Matching . . . . .	492
<i>Minsu Cho, Jungmin Lee, and Kyoung Mu Lee</i>	
Rotation Invariant Non-rigid Shape Matching in Cluttered Scenes . . . . .	506
<i>Wei Lian and Lei Zhang</i>	
Loosely Distinctive Features for Robust Surface Alignment . . . . .	519
<i>Andrea Albarelli, Emanuele Rodolà, and Andrea Torsello</i>	
Accelerated Hypothesis Generation for Multi-structure Robust Fitting . . . . .	533
<i>Tat-Jun Chin, Jin Yu, and David Suter</i>	

Aligning Spatio-Temporal Signals on a Special Manifold . . . . .	547
<i>Ruonan Li and Rama Chellappa</i>	
Supervised Label Transfer for Semantic Segmentation of Street Scenes . . . . .	561
<i>Honghui Zhang, Jianxiong Xiao, and Long Quan</i>	
Category Independent Object Proposals . . . . .	575
<i>Ian Endres and Derek Hoiem</i>	
Photo-Consistent Planar Patches from Unstructured Cloud of Points . . .	589
<i>Roberto Toldo and Andrea Fusiello</i>	
Contour Grouping and Abstraction Using Simple Part Models . . . . .	603
<i>Pablo Sala and Sven Dickinson</i>	
Dynamic Color Flow: A Motion-Adaptive Color Model for Object Segmentation in Video . . . . .	617
<i>Xue Bai, Jue Wang, and Guillermo Sapiro</i>	
What Is the Chance of Happening: A New Way to Predict Where People Look . . . . .	631
<i>Yezhou Yang, Mingli Song, Na Li, Jiajun Bu, and Chun Chen</i>	
Supervised and Unsupervised Clustering with Probabilistic Shift . . . . .	644
<i>Sanketh Shetty and Narendra Ahuja</i>	
Depth-Encoded Hough Voting for Joint Object Detection and Shape Recovery . . . . .	658
<i>Min Sun, Gary Bradski, Bing-Xin Xu, and Silvio Savarese</i>	
Shape Analysis of Planar Objects with Arbitrary Topologies Using Conformal Geometry . . . . .	672
<i>Lok Ming Lui, Wei Zeng, Shing-Tung Yau, and Xianfeng Gu</i>	
A Coarse-to-Fine Taxonomy of Constellations for Fast Multi-class Object Detection . . . . .	687
<i>Sanja Fidler, Marko Boben, and Aleš Leonardis</i>	
Object Classification Using Heterogeneous Co-occurrence Features . . . . .	701
<i>Satoshi Ito and Susumu Kubota</i>	
Converting Level Set Gradients to Shape Gradients . . . . .	715
<i>Siqi Chen, Guillaume Charpiat, and Richard J. Radke</i>	
A Close-Form Iterative Algorithm for Depth Inferring from a Single Image . . . . .	729
<i>Yang Cao, Yan Xia, and Zengfu Wang</i>	

Learning Shape Segmentation Using Constrained Spectral Clustering and Probabilistic Label Transfer .....	743
<i>Avinash Sharma, Etienne von Lavante, and Radu Horaud</i>	
Weakly Supervised Shape Based Object Detection with Particle Filter .....	757
<i>Xingwei Yang and Longin Jan Latecki</i>	
Geodesic Shape Retrieval via Optimal Mass Transport .....	771
<i>Julien Rabin, Gabriel Peyré, and Laurent D. Cohen</i>	
<b>Spotlights and Posters R2</b>	
Image Segmentation with Topic Random Field .....	785
<i>Bin Zhao, Li Fei-Fei, and Eric P. Xing</i>	
<b>Author Index</b> .....	799