

2015 IEEE International Conference on Computer Vision Workshop (ICCVW 2015)

**Santiago, Chile
7-13 December 2015**

Pages 1-586



**IEEE Catalog Number: CFP1591A-POD
ISBN: 978-1-4673-9712-4**

**Copyright © 2015 by the Institute of Electrical and Electronic Engineers, Inc
All Rights Reserved**

Copyright and Reprint Permissions: Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

******This publication is a representation of what appears in the IEEE Digital Libraries. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1591A-POD
ISBN (Print-On-Demand):	978-1-4673-9712-4
ISBN (Online):	978-1-4673-9711-7

Additional Copies of This Publication Are Available From:

Curran Associates, Inc
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: (845) 758-0400
Fax: (845) 758-2633
E-mail: curran@proceedings.com
Web: www.proceedings.com

CURRAN ASSOCIATES INC.
proceedings
.com

2015 IEEE International Conference on Computer Vision Workshops

ICCVW 2015

Table of Contents

Message from the General Chair and Program Chairs.....	xvii
Organizing Committee.....	xix
ICCV 2015 Area Chairs.....	xxi
Outstanding Reviewers.....	xxii
Sponsors.....	xxiii

Computer Vision for Affective Computing

Facial Micro-Expression Recognition Using Spatiotemporal Local Binary Pattern with Integral Projection	1
<i>Xiaohua Huang, Su-Jing Wang, Guoying Zhao, and Matti Piteikäinen</i>	
Facial Action Unit Detection Using Active Learning and an Efficient Non-linear Kernel Approximation	10
<i>Thibaud Senechal, Daniel McDuff, and Rana el Kaliouby</i>	
Do Deep Neural Networks Learn Facial Action Units When Doing Expression Recognition?	19
<i>Pooya Khorrami, Tom Le Paine, and Thomas S. Huang</i>	
FaceCept3D: Real Time 3D Face Tracking and Analysis	28
<i>Sergey Tulyakov, Radu-Laurențiu Vieriu, Enver Sangineto, and Nicu Sebe</i>	

Color and Photometry in Computer Vision

Metamer Mismatching and Its Consequences for Predicting How Colours are Affected by the Illuminant	34
<i>Xiandou Zhang, Brian Funt, and Hamidreza Mirzaei</i>	
HDR Recovery Under Rolling Shutter Distortions	41
<i>Sheetal B. Gupta, A. N. Rajagopalan, and Gunasekaran Seetharaman</i>	
A Hybrid Strategy for Illuminant Estimation Targeting Hard Images	49
<i>Roshanak Zakizadeh, Michael S. Brown, and Graham D. Finlayson</i>	

Learning a Deep Convolutional Network for Light-Field Image Super-Resolution	57
<i>Youngjin Yoon, Hae-Gon Jeon, Donggeun Yoo, Joon-Young Lee, and In So Kweon</i>	
N-to-SRGB Mapping for Single-Sensor Multispectral Imaging	66
<i>Yusuke Monno, Masayuki Tanaka, and Masatoshi Okutomi</i>	

3D Scene Understanding

Forensics Applications of Computer Vision and Pattern Recognition

Transferring and Adapting Source Knowledge in Computer Vision

Beyond Photo-Domain Object Recognition: Benchmarks for the Cross-Depiction Problem	74
<i>Hongping Cai, Qi Wu, and Peter Hall</i>	
Adapted Domain Specific Class Means	80
<i>Gabriela Csurka, Boris Chidlovskii, and Stéphane Clinchant</i>	
Anatomical Landmark Detection in Medical Applications Driven by Synthetic Data	85
<i>Gernot Riegler, Martin Urschler, Matthias Rüther, Horst Bischof, and Darko Stern</i>	

Computer Vision for Accessible and Affordable HealthCare

Computer Vision for Road Scene Understanding and Autonomous Driving

Position Interpolation Using Feature Point Scale for Decimeter Visual Localization	90
<i>David Wong, Daisuke Deguchi, Ichiro Ide, and Hiroshi Murase</i>	
Direct Visual Localisation and Calibration for Road Vehicles in Changing City Environments	98
<i>Geoffrey Pascoe, William Maddern, and Paul Newman</i>	
The Statistics of Driving Sequences — And What We Can Learn from Them	106
<i>Henry Bradler, Birthe Anne Wiegand, and Rudolf Mester</i>	
Latent Hierarchical Part Based Models for Road Scene Understanding	115
<i>Sahas Kashetty Venkateshkumar, Muralikrishna Sridhar, and Patrick Ott</i>	
Semantic Mapping of Large-Scale Outdoor Scenes for Autonomous Off-Road Driving	124
<i>Fernando Bernuy and Javier Ruiz del Solar</i>	
Sequential Score Adaptation with Extreme Value Theory for Robust Railway Track Inspection	131
<i>Xavier Gibert, Vishal M. Patel, and Rama Chellappa</i>	

Goal-Directed Pedestrian Prediction	139
<i>Eike Rehder and Horst Kloeden</i>	

Multi-sensor Fusion for Dynamic Scene Understanding

Fusion of Inertial and Visual Measurements for RGB-D SLAM on Mobile Devices	148
<i>Nicholas Brunetto, Samuele Salti, Nicola Fioraio, Tommaso Cavallari, and Luigi Di Stefano</i>	
Incremental Division of Very Large Point Clouds for Scalable 3D Surface Reconstruction	157
<i>Andreas Kuhn and Helmut Mayer</i>	
Video Event Recognition by Combining HDP and Gaussian Process	166
<i>Wentong Liao, Bodo Rosenhahn, and Machael Ying Yang</i>	
Surface Recovery: Fusion of Image and Point Cloud	175
<i>Siavash Hosseinyalamdary and Alper Yilmaz</i>	
A Multi-View Pedestrian Tracking Method in an Uncalibrated Camera Network	184
<i>Domonkos Varga, Tamás Szirányi, Attila Kiss, László Spórás, and László Havasi</i>	
A Modified Sequential Monte Carlo Bayesian Occupancy Filter Using Linear Opinion Pool for Grid Mapping	192
<i>Sang-II Oh and Hang-Bong Kang</i>	

Inverse Rendering

Joint Estimation of Depth, Reflectance and Illumination for Depth Refinement	199
<i>Kichang Kim, Akihiko Torii, and Masatoshi Okutomi</i>	
Bilayer Blind Deconvolution with the Light Field Camera	208
<i>Meiguang Jin, Paramanand Chandramouli, and Paolo Favaro</i>	
Multi-Shot Deblurring for 3D Scenes	217
<i>M. Arun, A. N. Rajagopalan, and Gunasekaran Seetharaman</i>	
Efficient and Robust Inverse Lighting of a Single Face Image Using Compressive Sensing	226
<i>Miguel Heredia Conde, Davoud Shahlajei, Volker Blanz, and Otmar Loffeld</i>	
Scene Intrinsic and Depth from a Single Image	235
<i>Evan Shelhamer, Jonathan T. Barron, and Trevor Darrell</i>	

ChaLearn Looking at People

ChaLearn Looking at People 2015: Apparent Age and Cultural Event Recognition Datasets and Results	243
<i>Sergio Escalera, Junior Fabian, Pablo Pardo, Xavier Baró, Jordi González, Hugo J. Escalante, Dusan Misevic, Ulrich Steiner, and Isabelle Guyon</i>	
DEX: Deep EXpectation of Apparent Age from a Single Image	252
<i>Rasmus Rothe, Radu Timofte, and Luc Van Gool</i>	
AgeNet: Deeply Learned Regressor and Classifier for Robust Apparent Age Estimation	258
<i>Xin Liu, Shaoxin Li, Meina Kan, Jie Zhang, Shuzhe Wu, Wenxian Liu, Hu Han, Shiguang Shan, and Xilin Chen</i>	
A Study on Apparent Age Estimation	267
<i>Yu Zhu, Yan Li, Guowang Mu, and Guodong Guo</i>	
Exploiting Feature Hierarchies with Convolutional Neural Networks for Cultural Event Recognition	274
<i>Mengyi Liu, Xin Liu, Yan Li, Xilin Chen, Alexander G. Hauptmann, and Shiguang Shan</i>	
Deep Spatial Pyramid Ensemble for Cultural Event Recognition	280
<i>Xiu-Shen Wei, Bin-Bin Gao, and Jianxin Wu</i>	
Better Exploiting OS-CNNs for Better Event Recognition in Images	287
<i>Limin Wang, Zhe Wang, Sheng Guo, and Yu Qiao</i>	
DLDR: Deep Linear Discriminative Retrieval for Cultural Event Classification from a Single Image	295
<i>Rasmus Rothe, Radu Timofte, and Luc Van Gool</i>	
Moving Poselets: A Discriminative and Interpretable Skeletal Motion Representation for Action Recognition	303
<i>Lingling Tao and René Vidal</i>	
Skeleton-Free Body Pose Estimation from Depth Images for Movement Analysis	312
<i>Ben Crabbe, Adeline Paiement, Sion Hannuna, and Majid Mirmehdi</i>	
Motion Recognition Employing Multiple Kernel Learning of Fisher Vectors Using Local Skeleton Features	321
<i>Yusuke Goutsu, Wataru Takano, and Yoshihiko Nakamura</i>	
Person Attribute Recognition with a Jointly-Trained Holistic CNN Model	329
<i>Patrick Sudowe, Hannah Spitzer, and Bastian Leibe</i>	
Deeply Learned Rich Coding for Cross-Dataset Facial Age Estimation	338
<i>Zhanghui Kuang, Chen Huang, and Wei Zhang</i>	

Deep Label Distribution Learning for Apparent Age Estimation	344
<i>Xu Yang, Bin-Bin Gao, Chao Xing, Zeng-Wei Huo, Xiu-Shen Wei, Ying Zhou, Jianxin Wu, and Xin Geng</i>	
Unconstrained Age Estimation with Deep Convolutional Neural Networks	351
<i>Rajeev Ranjan, Sabrina Zhou, Jun Cheng Chen, Amit Kumar, Azadeh Alavi, Vishal M. Patel, and Rama Chellappa</i>	
An End-to-End System for Unconstrained Face Verification with Deep Convolutional Neural Networks	360
<i>Jun-Cheng Chen, Rajeev Ranjan, Amit Kumar, Ching-Hui Chen, Vishal M. Patel, and Rama Chellappa</i>	
Coordinated Local Metric Learning	369
<i>Shreyas Saxena and Jakob Verbeek</i>	
Facial Landmark Localization in Depth Images Using Supervised Ridge Descent	378
<i>Necati Cihan Camgöz, Vitomir Štruc, Berk Gokberk, Lale Akarun, and Ahmet Alp Kindiroğlu</i>	
When Face Recognition Meets with Deep Learning: An Evaluation of Convolutional Neural Networks for Face Recognition	384
<i>Guosheng Hu, Yongxin Yang, Dong Yi, Josef Kittler, William Christmas, Stan Z. Li, and Timothy Hospedales</i>	
 Assistive Computer Vision and Robotics	
Recognizing Personal Contexts from Egocentric Images	393
<i>Antonino Furnari, Giovanni M. Farinella, and Sebastiano Battiato</i>	
An Evaluation of Supervised, Novelty-Based and Hybrid Approaches to Fall Detection Using Silmee Accelerometer Data	402
<i>Aneta Lisowska, Gavin Wheeler, Victor Ceballos Inza, and Ian Poole</i>	
An Intuitive Mobility Aid for Visually Impaired People Based on Stereo Vision	409
<i>Tobias Schwarze, Martin Lauer, Manuel Schwaab, Michailas Romanovas, Sandra Böhm, and Thomas Jürgensohn</i>	
Improving Indoor Mobility of the Visually Impaired with Depth-Based Spatial Sound	418
<i>Simon Blessenohl, Cecily Morrison, Antonio Criminisi, and Jamie Shotton</i>	
Estimating Body Pose of Infants in Depth Images Using Random Ferns	427
<i>Nikolas Hesse, Gregor Stachowiak, Timo Breuer, and Michael Arens</i>	
Accurate Human-Limb Segmentation in RGB-D Images for Intelligent Mobility Assistance Robots	436
<i>Siddhartha Chandra, Stavros Tsogkas, and Iasonas Kokkinos</i>	

Summarizing While Recording: Context-Based Highlight Detection for Egocentric Videos	443
<i>Yen-Liang Lin, Vlad I. Morariu, and Winston Hsu</i>	
Evaluating Real-Time Mirroring of Head Gestures Using Smart Glasses	452
<i>Juan R. Terven, Bogdan Raducanu, María-Elena Meza, and Joaquín Salas</i>	
Visual Attention-Guided Approach to Monitoring of Medication Dispensing Using Multi-location Feature Saliency Patterns	461
<i>Roman Palenichka, Ahmed Lakhssassi, and Myroslav Palenichka</i>	
Saliency Detection Using Quaternion Sparse Reconstruction	469
<i>Yi Zeng and Yi Xu</i>	
Deep Learning of Mouth Shapes for Sign Language	477
<i>Oscar Koller, Hermann Ney, and Richard Bowden</i>	
A Structured Committee for Food Recognition	484
<i>Niki Martinel, Claudio Piciarelli, Christian Micheloni, and Gian Luca Foresti</i>	
Single-Frame Indexing for 3D Hand Pose Estimation	493
<i>Cassandra Carley and Carlo Tomasi</i>	
A Fast and Accurate Eye Tracker Using Stroboscopic Differential Lighting	502
<i>Frank H. Borsato, Fernando O. Aluani, and Carlos H. Morimoto</i>	
Quantifying Levodopa-Induced Dyskinesia Using Depth Camera	511
<i>Maria Dyschel, David Arkadir, Hagai Bergman, and Daphna Weinshall</i>	
A Stereo Vision Approach for Cooperative Robotic Movement Therapy	519
<i>Benjamin Busam, Marco Esposito, Simon Che'Rose, Nassir Navab, and Benjamin Frisch</i>	
Head Nod Detection from a Full 3D Model	528
<i>Yiqiang Chen, Yu Yu, and Jean-Marc Odobez</i>	
Automatic Emotion Recognition in Robot-Children Interaction for ASD Treatment	537
<i>Marco Leo, Marco Del Coco, Pierluigi Carcagni, Cosimo Distanto, Massimo Bernava, Giovanni Pioggia, and Giuseppe Palestra</i>	
Fine-Grained Product Class Recognition for Assisted Shopping	546
<i>Marian George, Dejan Mircic, Gábor Sörös, Christian Floerkemeier, and Friedemann Mattern</i>	
Pedestrian Detection via Mixture of CNN Experts and Thresholded Aggregated Channel Features	555
<i>Ankit Verma, Ramya Hebbalaguppe, Lovekesh Vig, Swagat Kumar, and Ehtesham Hassan</i>	

Describing and Understanding Video and the Large Scale Movie Description

Visual Object Tracking

The Visual Object Tracking VOT2015 Challenge Results	564
<i>Matej Kristan, Jiri Matas, Aleš Leonardis, Michael Felsberg, Luka Čehovin, Gustavo Fernández, Tomáš Vojír, Gustav Häger, Georg Nebehay, and Roman Pflugfelder</i>	
Scalable Kernel Correlation Filter with Sparse Feature Integration	587
<i>Andrés Solís Montero, Jochen Lang, and Robert Laganière</i>	
Joint Scale-Spatial Correlation Tracking with Adaptive Rotation Estimation	595
<i>Mengdan Zhang, Junliang Xing, Jin Gao, Xinchu Shi, Qiang Wang, and Weiming Hu</i>	
Robust Visual Tracking by Exploiting the Historical Tracker Snapshots	604
<i>Jiatong Li, Zhibin Hong, and Baojun Zhao</i>	
Multi-template Scale-Adaptive Kernelized Correlation Filters	613
<i>Adel Bibi and Bernard Ghanem</i>	
Convolutional Features for Correlation Filter Based Visual Tracking	621
<i>Martin Danelljan, Gustav Häger, Fahad Shahbaz Khan, and Michael Felsberg</i>	
Tracker Fusion on VOT Challenge: How Does It Perform and What Can We Learn about Single Trackers?	630
<i>Christian Bailer and Didier Stricker</i>	
The Thermal Infrared Visual Object Tracking VOT-TIR2015 Challenge Results	639
<i>Michael Felsberg, Amanda Berg, Gustav Häger, Jörgen Ahlberg, Matej Kristan, Jiri Matas, Aleš Leonardis, Luka Čehovin, Gustavo Fernández, Tomáš Vojír, Georg Nebehay, and Roman Pflugfelder</i>	

Closing the Loop Between Vision and Language

Recovering 6D Object Pose

Object Understanding for Interaction

Extreme Imaging

A Century of Portraits: A Visual Historical Record of American High School Yearbooks	652
<i>Shiry Ginosar, Kate Rakelly, Sarah Sachs, Brian Yin, and Alexei A. Efros</i>	
Scotopic Visual Recognition	659
<i>Bo Chen and Pietro Perona</i>	

FlatCam: Replacing Lenses with Masks and Computation	663
<i>M. Salman Asif, Ali Ayremlou, Ashok Veeraraghavan, Richard Baraniuk, and Aswin Sankaranarayanan</i>	
Low Power Depth and Velocity from a Passive Moving Sensor	667
<i>Emma Alexander, Sanjeev J. Koppal, and Todd Zickler</i>	
Estimating a Small Signal in the Presence of Large Noise	671
<i>Amy Zhao, Frédo Durand, and John Guttag</i>	
Exploring the Resolution Limit for In-Air Synthetic-Aperture Audio Imaging	677
<i>Hisham Bedri, Micha Feigin, Petros T. Boufounos, and Ramesh Raskar</i>	
Crowdpainting with Light: Participatory Imaging at the Big Shot	683
<i>Michael Peres and Andreas Savakis</i>	

ImageNet and MS COCO Visual Recognition

3D Reconstruction and Understanding with Video and Sound

Preface to 3D Reconstruction and Understanding with Video and Sound	688
<i>Dinesh Manocha, Marc Pollefeys, Rif Saurous, Rahul Sukthankar, and Ruigang Yang</i>	
Seeing the Sound: A New Multimodal Imaging Device for Computer Vision	693
<i>Andrea Zunino, Marco Crocco, Samele Martelli, Andrea Trucco, Alessio Del Bue, and Vittorio Murino</i>	
Tracking the Active Speaker Based on a Joint Audio-Visual Observation Model	702
<i>Israel D. Gebru, Siléye Ba, Georgios Evangelidis, and Radu Horaud</i>	
Person Tracking Using Audio and Depth Cues	709
<i>Qingju Liu, Teofilo de Campos, Wenwu Wang, Philip Jackson, and Adrian Hilton</i>	

Computer Vision in Sports

Tennis Player Segmentation for Semantic Behavior Analysis	718
<i>Vito Renò, Nicola Mosca, Massimiliano Nitti, Tiziana D’Orazio, Donato Campagnoli, Andrea Prati, and Ettore Stella</i>	
Stroboscopic Image Synthesis of Sports Player from Hand-Held Camera Sequence	726
<i>Kunihiro Hasegawa and Hideo Saito</i>	
Soccer Jersey Number Recognition Using Convolutional Neural Networks	734
<i>Sebastian Gerke, Karsten Müller, and Ralf Schäfer</i>	
Tracking When the Camera Looks Away	742
<i>Khurram Soomro, Salman Khokhar, and Mubarak Shah</i>	
Attributed Graphs for Tracking Multiple Objects in Structured Sports Videos	751
<i>Henrique Morimitsu, Roberto M. Cesar-Jr., and Isabelle Bloch</i>	

Understanding Sport Activities from Correspondences of Clustered Trajectories	760
<i>Francesco Turchini, Lorenzo Seidenari, and Alberto Del Bimbo</i>	
Audio-Visual Classification of Sports Types	768
<i>Rikke Gade, Mohamed Abou-Zleikha, Mads Græsbøll Christensen, and Thomas B. Moeslund</i>	
Injury Mechanism Classification in Soccer Videos	774
<i>O. V. Ramana Murthy and Roland Goecke</i>	
Predicting Ball Ownership in Basketball from a Monocular View Using Only Player Trajectories	780
<i>Xinyu Wei, Long Sha, Patrick Lucey, Peter Carr, Sridha Sridharan, and Iain Matthews</i>	
Depth Compensation Model for Gaze Estimation in Sport Analysis	788
<i>Fabricio Batista Narcizo and Dan Witzner Hansen</i>	
3D Representation and Recognition	
3-D Volumetric Shape Abstraction from a Single 2-D Image	796
<i>Pablo Sala and Sven Dickinson</i>	
Building the View Graph of a Category by Exploiting Image Realism	805
<i>Attila Szabó, Andrea Vedaldi, and Paolo Favaro</i>	
Dense Rigid Reconstruction from Unstructured Discontinuous Video	814
<i>Karel Lebeda, Simon Hadfield, and Richard Bowden</i>	
Reconstruction of Articulated Objects from a Moving Camera	823
<i>Kaan Yücer, Oliver Wang, Alexander Sorkine-Hornung, and Olga Sorkine-Hornung</i>	
Geodesic Convolutional Neural Networks on Riemannian Manifolds	832
<i>Jonathan Masci, Davide Boscaini, Michael M. Bronstein, and Pierre Vandergheynst</i>	
Machine Learning for Intelligent Image and Video Processing	
Robust Subspace Learning and Computer Vision	
A Simple Method for Subspace Estimation with Corrupted Columns	841
<i>Viktor Larsson, Carl Olsson, and Fredrik Kahl</i>	
Dual Principal Component Pursuit	850
<i>Manolis C. Tsakiris and René Vidal</i>	
Sparse Subspace Clustering for Incomplete Images	859
<i>Xiao Wen, Linbo Qiao, Shiqian Ma, Wei Liu, and Hong Cheng</i>	
Filtrated Spectral Algebraic Subspace Clustering	868
<i>Manolis C. Tsakiris and René Vidal</i>	

Pose and Expression-Coherent Face Recovery in the Wild	877
<i>Xavier P. Burgos-Artizzu, Joaquin Zepeda, François Le Clerc, and Patrick Pérez</i>	
Robust Matrix Regression for Illumination and Occlusion Tolerant Face Recognition	886
<i>Jianchun Xie, Jian Yang, Jianjun Qian, and Ying Tai</i>	
Image Saliency Detection with Sparse Representation of Learnt Texture Atoms	894
<i>Lai Jiang, Mai Xu, Zhaoting Ye, and Zulin Wang</i>	
Object Extraction from Bounding Box Prior with Double Sparse Reconstruction	903
<i>Lingzheng Dai, Jundi Ding, Jian Yang, Fanlong Zhang, and Junxia Li</i>	
Visual Tracking via Nonnegative Regularization Multiple Locality Coding	912
<i>Fanghui Liu, Tao Zhou, Jie Yang, and Irene Y. H. Gu</i>	
Multi-resolution Dynamic Mode Decomposition for Foreground/Background Separation and Object Tracking	921
<i>J. Nathan Kutz, Xing Fu, Steve L. Brunton, and N. Benjamin Erichson</i>	
Background Subtraction via Superpixel-Based Online Matrix Decomposition with Structured Foreground Constraints	930
<i>Sajid Javed, Seon Ho Oh, Andrews Sobral, Thierry Bouwmans, and Soon Ki Jung</i>	
Adaptive Low Rank Approximation for Tensors	939
<i>Xiaofei Wang and Carmeliza Navasca</i>	
Online Stochastic Tensor Decomposition for Background Subtraction in Multispectral Video Sequences	946
<i>Andrews Sobral, Sajid Javed, Soon Ki Jung, Thierry Bouwmans, and El-hadi Zahzah</i>	
 300 Videos in the Wild: Facial Landmark Tracking in-the-Wild	
Offline Deformable Face Tracking in Arbitrary Videos	954
<i>Grigoris G. Chrysos, Epameinondas Antonakos, Stefanos Zafeiriou, and Patrick Snape</i>	
Facial Landmark Tracking by Tree-Based Deformable Part Model Based Detector	963
<i>Michal Uričář, Vojtěch Franc, and Václav Hlaváč</i>	
Multi-view Constrained Local Models for Large Head Angle Facial Tracking	971
<i>Georgia Rajamanoharan and Timothy F. Cootes</i>	
Shape Augmented Regression Method for Face Alignment	979
<i>Yue Wu and Qiang Ji</i>	
Facial Landmark Detection via Progressive Initialization	986
<i>Shengtao Xiao, Shuicheng Yan, and Ashraf A. Kassim</i>	

Facial Shape Tracking via Spatio-Temporal Cascade Shape Regression	994
<i>Jing Yang, Jiankang Deng, Kaihua Zhang, and Qingshan Liu</i>	
The First Facial Landmark Tracking in-the-Wild Challenge: Benchmark and Results	1003
<i>Jie Shen, Stefanos Zafeiriou, Grigoris G. Chrysos, Jean Kossaifi, Georgios Tzimiropoulos, and Maja Pantic</i>	

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

Web-Scale Vision and Social Media

Scalable Sketch-Based Image Retrieval Using Color Gradient Features	1012
<i>Tu Bui and John Collomosse</i>	
Fisher Encoded Convolutional Bag-of-Windows for Efficient Image Retrieval and Social Image Tagging	1020
<i>Tiberio Uricchio, Marco Bertini, Lorenzo Seidenari, and Alberto Del Bimbo</i>	
Geometric Mining: Scaling Geometric Hashing to Large Datasets	1027
<i>Andrew Gilbert and Richard Bowden</i>	

Vision from Satellite to Street

Single Frame Based Video Geo-Localisation Using Structure Projection	1036
<i>C. Bodensteiner, S. Bullinger, S. Lemaire, and M. Arens</i>	
Semantic Cross-View Matching	1044
<i>Francesco Castaldo, Amir Zamir, Roland Angst, Francesco Palmieri, and Silvio Savarese</i>	

Video Summarization for Large-Scale Analytics

Hierarchical Union-of-Subspaces Model for Human Activity Summarization	1053
<i>Tong Wu, Prudhvi Gurram, Raghuvver M. Rao, and Waheed U. Bajwa</i>	
A Scalable Architecture for Operational FMV Exploitation	1062
<i>William R. Thissell, Robert Czajkowski, Frank Schrenk, Timothy Selway, Anthony J. Ries, Shamoli Patel, Patricia L. McDermott, Rod Moten, Ron Rudnicki, Guna Seetharaman, Ilker Ersoy, and Kannappan Palaniappan</i>	
Video Summarization via Segments Summary Graphs	1071
<i>Mahmut Demir and H. Işıl Bozma</i>	
Towards Large-Scale Face Recognition Based on Videos	1078
<i>Meltem Yalcin, Hakan Cevikalp, and Hasan Serhan Yavuz</i>	
Fast Structure from Motion for Sequential and Wide Area Motion Imagery	1086
<i>Hadi AliAkbarpour, Kannappan Palaniappan, and Guna Seetharaman</i>	