

2011 8th IEEE International Conference on Advanced Video and Signal Based Surveillance

(AVSS 2011)

**Klagenfurt, Austria
30 August – 2 September 2011**



**IEEE Catalog Number: CFP11AVS-PRT
ISBN: 978-1-4577-0844-2**

Contents

Message from the General Chairs	iii
Organization	v
Part I.: Main track	1
Keynote lecture	2
Keynote: Photo Forensics: There is more to a picture than meets the eye.	3
<i>Nasir Memon</i>	
Oral Session 1: Pose, gait and faces	4
Combined Estimation of Location and Body Pose in Surveillance Video	5
<i>Cheng Chen, Alexandre Heili and Jean-Marc Odobez</i>	
Gaze and Body Pose Estimation from a Distance	11
<i>Nils Krahnstoeber, Ming-Ching Chang and Weina Ge</i>	
Pairwise Shape Configuration-based PSA for Gait Recognition under Small Viewing Angle Change	17
<i>Worapan Kusakunniran, Qiang Wu, Jian Zhang and Hongdong Li</i>	
Learning to Recognize Faces from Videos and Weakly Related Information Cues	23
<i>Martin Köstinger, Paul Wohlhart, Peter M. Roth and Horst Bischof</i>	
Oral Session 2: Object detection	29
Data Driven Frequency Mapping for Computationally Scalable Object Detection	30
<i>Fatih Porikli and Huseyin Ozkan</i>	
Modeling of Temporarily Static Objects for Robust Abandoned Object Detection in Urban Surveillance	36
<i>Quanfu Fan and Sharath Pankanti</i>	
A New Multi-Lateral Filter for Real-Time Depth Enhancement	42
<i>Björn Ottersten, Frederic Garcia, Djamila Aouada, Bruno Mirbach and Thomas Solognac</i>	
Poster Session A	48
<i>Crowd analysis</i>	49
Stereoscopic Viewing Facilitates the Perception of Crowds	49
<i>Mikko Kytö, Jukka Häkkinen and Pirkko Oittinen</i>	
Robust People Counting in Video Surveillance: Dataset and System	54
<i>Jingwen Li, Lei Huang and Changping Liu</i>	

Crowd Flow Estimation Using Multiple Visual Features For Scenes With Changing Crowd Densities	60
<i>Satyam Srivastava, Ka Ki Ng and Ed Delp</i>	
Real-time person counting by propagating networks flows	66
<i>Michael Pätzold and Thomas Sikora</i>	
Complementary Background Models for the Detection of Static and Moving Objects in Crowded Environments	71
<i>Ruben Heras Evangelio and Thomas Sikora</i>	
<i>Audio surveillance</i>	77
Multiple Acoustic Sources Localization Using Incident Signal Power Comparison	77
<i>Daniele Salvati, Antonio Rodà, Sergio Canazza and Gian Luca Foresti</i>	
Tracking sound sources by means of HMM	83
<i>Antonio Rodà and Christian Micheloni</i>	
Hierarchical approach for abnormal acoustic event classification in an elevator	89
<i>Kwangyoun Kim and Hanseok KO</i>	
<i>Activity monitoring</i>	95
Mono versus multi-view tracking-based model for automatic scene activity modeling and anomaly detection	95
<i>Erwan Jouneau and Cyril Carincotte</i>	
Discrimination of abandoned and stolen object based on active contours	101
<i>Luis Caro-Campos, Juan Carlos San Miguel Avedillo and Jose M. Martinez</i>	
Action recognition using tri-view constraints	107
<i>Yang Wang, Lin Wu and Xiaodi Huang</i>	
Detection of Abnormal Behaviour in a Surveillance Environment Using Control Charts	113
<i>Stefan Hommes, Radu State, Andreas Zinnen and Thomas Engel</i>	
Modeling of Moving Object Trajectory by Spatio-temporal Learning for Abnormal Behavior Detection	119
<i>Hawook Jeong, Hyung Jin Chang and Jin Young Choi</i>	
Abnormal Events Detection using Unsupervised One-Class SVM - Application to Audio Surveillance and Evaluation	124
<i>Bertrand Ravera, Sébastien Lecomte, Régis Lengellé, Cédric Richard and François Capman</i>	
<i>Tracking</i>	130
An Improved Mean Shift Tracker with Fast Failure Recovery Strategy after Complete Occlusion	130
<i>Gaetano Di Caterina and John J Soraghan</i>	
Extended Feature-based Object Tracking in Presence of Data Association Uncertainty	136
<i>Mauricio Soto Alvarez and Carlo S Regazzoni</i>	

Appearance tracking by transduction in surveillance scenarios	142
<i>Dalia Coppi, Simone Calderara and Rita Cucchiara</i>	
Real Time Color Based Particle Filtering for Object Tracking with Dual Cache Architecture .	148
<i>Der-Chun Cherng, Sheng-Yan Yang, Chun-Fu Shen and Yan-Chen Lu</i>	
<i>Active and multiple camera systems</i>	154
Multi-tasking Smart Cameras for Intelligent Video Surveillance Systems	154
<i>Wiktor Starzyk and Faisal Z. Qureshi</i>	
Continuous Recovery for Real Time Pan Tilt Zoom Localization and Mapping	160
<i>Alberto Del Bimbo, Giuseppe Lisanti, Iacopo Masi and Federico Pernici</i>	
A Unified Rectification Method for Single Viewpoint Multi-Camera System	166
<i>Jilin Liu, Yanchang Wang, Bin Yang, Jingting Ding and Xiaojin Gong</i>	
Efficiently Secure Image Transmission against Tampering in Wireless Visual Sensor Networks	172
<i>Gowun Jeong and Hyun-Seung Yang</i>	
Oral Session 3: Object tracking and re-identification	178
Multiple-shot Human Re-Identification by Mean Riemannian Covariance Grid	179
<i>Slawomir Bak, Etienne Corvee, Francois Bremond and Thonnat Monique</i>	
Multiple view, multiple target tracking with principal axis-based data association	185
<i>Francisco Madrigal and Jean-Bernard Hayet</i>	
Formulation, Detection and Application of Occlusion States (Oc-7) in the Context of Multiple Object Tracking	191
<i>Prithwjit Guha, Amitabha Mukerjee and Venkatesh K Subramanian</i>	
View-invariant Person Re-identification with an Implicit Shape Model	197
<i>Kai Jüngling and Michael Arens</i>	
Keynote lecture	203
Keynote: Novel Communication Architectures for Wireless Multimedia Sensor Networks . . .	204
<i>Ian F. Akyildiz</i>	
Oral Session 4: Activity monitoring	205
Unsupervised Learning of Micro-Action Exemplars using a Product Manifold	206
<i>Stephen O'Hara and Bruce Draper</i>	
Learning Neighborhood Co-occurrence Statistics of Sparse Features for Human Activity Recog- nition	212
<i>Prithviraj Banerjee and Ram Nevatia</i>	
Multi-camera Open Space Human Activity Discovery for Anomaly Detection	218
<i>Rémi Emonet, Jagannadan Varadarajan and Jean-Marc Odobez</i>	

Automatic Detection of Dangerous Motion Behavior in Human Crowds	224
<i>Barbara Krausz and Christian Bauckhage</i>	
Textures of Optical Flow for Real-Time Anomaly Detection in Crowds	230
<i>David Ryan, Simon Denman, Clinton Fookes and Sridha Sridharan</i>	
Oral Session 5: Background subtraction (part I)	236
A Real-Time Image-to-Panorama Registration Approach for Background Subtraction Using Pan-Tilt-Cameras	237
<i>Eduardo Monari and Thomas Pollok</i>	
Background Subtraction by Non-parametric Probabilistic Clustering	243
<i>Alessandro Lanza, Samuele Salti and Luigi Di Stefano</i>	
Regularized Online Mixture of Gaussians for background subtraction	249
<i>Hongbin Wang and Paul Miller</i>	
Poster Session B	255
<i>Object detection</i>	256
People Detection Based on Appearance and Motion Models	256
<i>Álvaro García-Martín, Alexander Hauptmann and Jose M. Martinez</i>	
Robust Adapted Object Detection Under Complex Environment	261
<i>Kenji Iwata, Ryushi Ozaki, Xinyue Zhao, Yutaka Satoh, Hidenori Takauji and Shun'ichi Kaneko</i>	
A Multi-Stage Pedestrian Detection Using Monolithic Classifiers	267
<i>Giovanni Gualdi, Andrea Prati and Rita Cucchiara</i>	
Object Detection through Edge Behavior Modeling	273
<i>Adin Ramirez, Mahbub Murshed and Oksam Chae</i>	
Fast Face Detection and Species Classification of African Great Apes	279
<i>Andreas Ernst and Christian Küblbeck</i>	
An Efficient Pattern-Less Background Modeling based on Scale Invariant Local States	285
<i>Jacky Shun-Cho Yuk and Kwan-Yee Kenneth Wong</i>	
<i>Person re-identification</i>	291
Evaluation of Local Features for Person Re-Identification in Image Sequences	291
<i>Martin Bäuml and Rainer Stiefelhagen</i>	
A MultiView Appearance Model for people re-identification	297
<i>Donatello Conte, Pasquale Foggia, Gennaro Percannella and Mario Vento</i>	
People re-identification across multiple non-overlapping cameras system by appearance classi- fication and silhouette part segmentation	303
<i>Kheir-Eddine Aziz, Djamel Merad and Bernard Fertil</i>	

Frontal-to-side face re-identification based on hair, skin and clothes patches	309
<i>Antitza Dantcheva and Jean-Luc Dugelay</i>	
<i>Evaluation and datasets</i>	314
A Testing Framework for Background Subtraction Algorithms Comparison in Intrusion Detection Context	314
<i>Corentin Lallier, Emanuelle Reynaud, Lionel Robinault and Laure Tougne</i>	
Online failure detection and correction for Bayesian sparse feature-based object tracking . . .	320
<i>Tewodros Atanaw Biresaw, Mauricio Soto Alvarez and Carlo S Regazzoni</i>	
Naturalistic Data Sets for Image and Behavior Analysis - "Normal" versus "Anomalous" Events	325
<i>Philippe Rolland, William K Krebs and Annetta Burger</i>	
<i>Visualization and attention</i>	331
Resolution Enhancement of ROI from Surveillance Video using Bernstein Interpolation	331
<i>Minjae Kim and Hanseok KO</i>	
A Comparison of a Chaos-theoretic Method for Pre-attentive Vision with Traditional Grayscale-based Methods	337
<i>Michael Farmer</i>	
Next-Generation 3D Visualization for Visual Surveillance	343
<i>Josef Birchbauer, Norbert Brändle, Sven Havemann, Horst Bischof, Peter M. Roth, Volker Settgast, Peter Widhalm and Marcel Lancell</i>	
Improving the Efficiency and Accuracy of Visual Attention	349
<i>Víctor Fernández-Carbajales Canete, Miguel Angel Garcia and Jose M. Martinez</i>	
<i>Object recognition</i>	355
3D Ellipsoid Fitting for Multi-view Gait Recognition	355
<i>Clinton Fookes, Sabesan Sivapalan, Daniel C.Y. Chen, Simon Denman and Sridha Sridharan</i>	
Part-based Clothing Segmentation for Person Retrieval	361
<i>Michael Weber, Martin Bäuml and Rainer Stiefelhagen</i>	
Image-based Vehicle Indexing for a Seaport Transportation Surveillance System	367
<i>Killian Doyle, David A Sadlier, Paul Ferguson, Ciarán Ó Conaire and Noel. E. O'Connor</i>	
Automatic make and model recognition from frontal images of cars	373
<i>Greg Pearce and Nick Pears</i>	
Learning to Recognize People in a Smart Environment	379
<i>Ting Yu, Yi Yao, Dashan Gao and Peter H. Tu</i>	
Oral Session 6: Background subtraction (part II)	385
Speeded up Gaussian Mixture Model Algorithm for Background Subtraction	386
<i>Pushkar Gorur and Bharadwaj Amrutur</i>	
Robust Background Subtraction using Data Fusion for Real Elevator Scene	392
<i>Taeyup Song, K. Han David and Hanseok KO</i>	

Part II.: Workshops and Industrial Surveillance Day **398**

Workshop on Multimedia Systems for Surveillance (MMSS) **399**

Keynote: Surveillance Camera Identification Using Noise Patterns 400
Chang-Tsun Li

Keynote: Vision of the Crowds 401
László Böszörményi

Smart Resource-aware Multimedia Sensor Network for Automatic Detection of Complex Events 402
Claudio Picciarelli, Christian Micheloni, Sabrina Londero, Massimiliano Valotto, Paolo Omero, Bernhard Rinner, Fadi Al Machot, Carlo Tasso, Bernhard Dieber and Kyandoghere Kyamakya

Optimizing Mean Reciprocal Rank for Person Re-identification 408
Shihong Lao, Yang Wu, Masayuki Mukunoki, Takuya Funatomi and Michihiko Minoh

A robust approach for on-line and off-line threat detection based on event tree similarity analysis 414
Francesco Flammini, Concetta Pragliola, Alfio Pappalardo and Valeria Vittorini

On Building Decentralized Wide-Area Surveillance Networks based on ONVIF 420
Ivo Keller, Thomas Sikora, Tobias Senst, Michael Pätzold, Rubén Heras Evangelio and Volker Eiselein

Multi-Agent System for Moving Object Segmentation and Tracking 424
M. Chakroun, A. Wali and A.M. Alimi

Workshop on Resource Aware Sensor and surveillance NETWORKS (RAWSNETS) **430**

Keynote: Design Issues in Multi-Camera Systems 431
Mohan S. Kankanhalli

Dynamic Resource Allocation for Probabilistic Tracking via Attentive Sensing and Sampling . 432
Oswald Lanz and Tao Hu

PTZ network configuration for optimal 3D coverage 435
Claudio Picciarelli and Gian Luca Foresti

Resource-Aware Sensor Selection and Task Assignment 438
Bernhard Dieber and Bernhard Rinner

Activity Aware Video Collection to Minimize Resource Usage in Smart Camera Nodes 441
Faisal Z. Qureshi

Energy-Aware Objects Abandon / Removal Detection 443
Luca Benini, Alessandro Lanza, Michele Magno, Davide Brunelli and Luigi Di Stefano

Modeling and Optimization of Dynamic Signal Processing in Resource-Aware Sensor Networks 449
Hsiang-Huang Wu, Shuvra S. Bhattacharyya, William Plishker, Nimish Sane and Chung-Ching Shen

Dynamic Resource Aware Sensor Networks: Integration of Sensor Cloud and ERPs 455
Mahsa Baktashmotlagh, Abbas Bigdeli and Brian C. Lovell

Workshop on Activity monitoring by multi-camera surveillance systems (AMMCSS)	461
Determining Operational Measures from Multi-Camera Surveillance Systems using Soft Biometrics	462
<i>Simon Denman, Alina Bialkowski, Clinton Fookes and Sridha Sridharan</i>	
Real Time Complex Event Detection for Resource-Limited Multimedia Sensor Networks . . .	468
<i>Fadi Al Machot, Kyandoghere Kyamakya, Bernhard Dieber and Bernhard Rinner</i>	
A Game-theoretic Design for Collaborative Tracking in a Video Camera Network	474
<i>Zongjie Tu and Prabir Bhattacharya</i>	
Multi-Camera Detection Association for 3D Localisation	480
<i>Jiali Shen, Paul Miller, Huiyu Zhou and Michael Loughlin</i>	
Improved Person Detection in Industrial Environments using Multiple Self-Calibrated Cameras	486
<i>Luc Van Gool, Roland Mörzinger, Marcus Thaler, Severin Stalder and Helmut Grabner</i>	
Multiple Views Based Human Motion Tracking in Surveillance Videos	492
<i>Bogdan Kwolek</i>	
HSV and RGB color histograms comparing for objects tracking among non overlapping FOVs, using CBTF	498
<i>Marco Leo, Pier Luigi Mazzeo, Luciano Giove, Giuseppe M. Moramarco and Paolo Spagnolo</i>	
Industrial Surveillance Day	504
Message from the Industrial Chair	505
ISD Keynotes	506
Keynote: New concepts in Airborne and Ground Surveillance Systems	507
<i>Michele Genisio</i>	
Keynote: Active Video Analytics – One leap ahead applicability and entering new dimensions	508
<i>Josef Birchbauer</i>	
ISD Oral Session	510
Traffic video detection: a manufacturers’ point of view	511
<i>Wouter Favoreel</i>	
A high-way operator’s view on automated video surveillance	512
<i>Nikolaus Viertl</i>	
ISD Demos and Exhibits	513
Real-time Human Detection Using Fast Contour Template Matching for Visual Surveillance .	514
<i>Csaba Beleznai, Michael Rauter and Dan Shao</i>	
People flow analysis	515
<i>Stephane Clauss and Fabien Pelisson</i>	

PRIMA-S zur Maskierung von Privatzenen in Videobildern	516
<i>Udo Kürzdörfer</i>	
A Systems Level Approach to Perimeter Protection	517
<i>Sung Chun Lee, Hale Kim, Phil Kyu Rhee, Joong-Hwan Baek, Peter H. Tu, Ting Yu, Dashan Gao and Ram Nevatia</i>	
People and Object Sensing Solutions based on 3D MLI Sensor(TM) Technology	519
<i>Frederic Garcia, Bruno Mirbach and Ángel Cuesta-Contreras</i>	
GPU Enabled Smart Video Node	521
<i>Ashutosh Morde, Sadiye Guler, Jay Silverstein, Ian Pushee and Xiang Ma</i>	
Interactive Person-Retrieval in a Distributed Camera Network	525
<i>Martin Bäuml and Rainer Stiefelhagen</i>	
A Large-scale Benchmark Dataset for Event Recognition in Surveillance Video	527
<i>Chia-Chih Chen, Mita Desai, Mubarak Shah, Jong Taek Lee, Carl Vondrick, Saurajit Mukherjee, Hamed Pirsiavash, J. K. Aggarwal, Deva Ramanan, Hyungtae Lee, Jenny Yuen, Larry Davis, Sang-min Oh, Antonio Torralba, Eran Swears, Anthony Hoogs, Bi Song, Xiaoyang Wang, Amitha Perera, Anesco Fong, Qiang Ji, Naresh Cuntoor, Amit Roy-Chowdhury and Kishore Reddy</i>	
Smart Resource-Aware Multi-Sensor Network	529
<i>Sabrina Londero, Paolo Omero, Carlo Tasso, Massimiliano Valotto, Christian Micheloni, Claudio Piciarelli, Fadi Al Machot, Kyandoghere Kyamakya, Bernhard Dieber and Bernhard Rinner</i>	
Construction Site Monitoring from Highly-Overlapping MAV images	531
<i>Josef Birchbauer, Stefan Kluckner and Claudia Windisch</i>	
OUTLIER – Online Learning and Visualization of Unusual Events	533
<i>Samuel Schuster, Rene Schuster, Martin Winter, Peter Schallauer, Josef Birchbauer, Peter M. Roth, Horst Bischof and Georg Poier</i>	
Intelligent Crossing Sensor and Vehicle Detector	535
<i>Marcin Rosner</i>	
VTrack: Video Analytics for automatic video-surveillance	536
<i>Simone de Titta, Gianluca Gera and Lucio Marcenaro</i>	
Pedestrian sensing for increased traffic safety and efficiency at signalized intersections	539
<i>Wouter Favoreel</i>	
Level of Service Classification for Smart Cameras	543
<i>Manfred Harrer, Thomas Mariacher, Felix Pletzer, Bernhard Rinner, Roland Tusch and László Böszörményi</i>	