

2010 20th International Conference on Pattern Recognition

(ICPR 2010)

**Istanbul, Turkey
23-26 August 2010**

Pages 1-757



IEEE Catalog Number: CFP10182-PRT
ISBN: 978-1-4244-7542-1

2010 International Conference on Pattern Recognition

ICPR 2010

Table of Contents

Message from General Chair.....	lxxviii
Message from Technical Program Chairs.....	lxxx
Organizing Committee.....	lxxxi
ICPR 2010 Track Co-chairs.....	lxxxiii
Reviewers.....	lxxxv

Image Analysis I

Minimizing Geometric Distance by Iterative Linear Optimization	1
<i>Yisong Chen, Jiewei Sun, and Guoping Wang</i>	
Hyper Least Squares and Its Applications	5
<i>Prasanna Rangarajan, Kenichi Kanatani, Hirotaka Niitsuma, and Yasuyuki Sugaya</i>	
Integrating a Discrete Motion Model into GMM Based Background Subtraction	9
<i>Christian Wolf and Jean-Michel Jolion</i>	
Saliency Based on Multi-scale Ratio of Dissimilarity	13
<i>Rui Huang, Nong Sang, Leyuan Liu, and Qiling Tang</i>	
Online Principal Background Selection for Video Synopsis	17
<i>Shikun Feng, Shengcai Liao, Zhiyong Yuan, and Stan Z. Li</i>	

Support Vector Machines

Large Margin Classifier Based on Affine Hulls	21
<i>Hakan Cevikalp and Hasan Serhan Yavuz</i>	
2D Shape Recognition Using Information Theoretic Kernels	25
<i>Manuele Bicego, André Filipe Torres Martins, Vittorio Murino, Pedro M.Q. Aguiar, and Mário A.T. Figueiredo</i>	
Time Series Classification Using Support Vector Machine with Gaussian Elastic Metric Kernel	29
<i>Dongyu Zhang, Wangmeng Zuo, David Zhang, and Hongzhi Zhang</i>	
Multiplicative Update Rules for Multilinear Support Tensor Machines	33
<i>Irene Kotsia and Ioannis Patras</i>	

Support Vectors Selection for Supervised Learning Using an Ensemble Approach	37
<i>Li Guo, Samia Boukir, and Nesrine Chehata</i>	

Motion and Multiple-View Vision I

Estimating Apparent Motion on Satellite Acquisitions with a Physical Dynamic Model	41
<i>Etienne Huot, Isabelle Herlin, Nicolas Mercier, and Evgeny Plotnikov</i>	
Multiple View Geometries for Mirrors and Cameras	45
<i>Shinji Fujiyama, Fumihiko Sakaue, and Jun Sato</i>	
Perspective Reconstruction and Camera Auto-Calibration as Rectangular Polynomial Eigenvalue Problem	49
<i>Ákos Pernek and Levente Hajder</i>	
Multi-camera Platform Calibration Using Multi-linear Constraints	53
<i>Patrik Nyman, Anders Heyden, and Kalle Åström</i>	
A Game-Theoretic Approach to Robust Selection of Multi-view Point Correspondence	57
<i>Emanuele Rodolà, Andrea Albarelli, and Andrea Torsello</i>	

Ensemble Learning

A Bias-Variance Analysis of Bootstrapped Class-Separability Weighting for Error-Correcting Output Code Ensembles	61
<i>Raymond Stuart Smith and Terry Windeatt</i>	
Multi-class AdaBoost with Hypothesis Margin	65
<i>Xiaobo Jin, Xinwen Hou, and Cheng-Lin Liu</i>	
A Score Decidability Index for Dynamic Score Combination	69
<i>Carlo Lohrano, Roberto Tronci, Giorgio Giacinto, and Fabio Roli</i>	
AUC-based Combination of Dichotomizers: Is Whole Maximization also Effective for Partial Maximization?	73
<i>Maria Teresa Ricamato and Francesco Tortorella</i>	
Random Prototype-based Oracle for Selection-fusion Ensembles	77
<i>Giuliano Armano and Nima Hatami</i>	

Detection and Segmentation of Audio Signals

Noise-Robust Voice Activity Detector Based on Hidden Semi-Markov Models	81
<i>Xianglong Liu, Yuan Liang, Yihua Lou, He Li, and Baosong Shan</i>	
Simultaneous Segmentation and Modelling of Signals Based on an Equipartition Principle	85
<i>Costas Panagiotakis</i>	
Voice Activity Detection Based on Complex Exponential Atomic Decomposition and Likelihood Ratio Test	89
<i>Shiwen Deng and Jiqing Han</i>	

Speaker Change Detection Based on the Pairwise Distance Matrix	93
<i>Jin S. Seo</i>	

Real-Time User Position Estimation in Indoor Environments Using Digital Watermarking for Audio Signals	97
<i>Ryosuke Kaneto, Yuta Nakashima, and Noboru Babaguchi</i>	

Human Computer Interaction

Gaze Probing: Event-Based Estimation of Objects Being Focused On	101
<i>Ryo Yonetani, Hiroaki Kawashima, Takatsugu Hirayama, and Takashi Matsuyama</i>	
A Covariate Shift Minimisation Method to Alleviate Non-stationarity Effects for an Adaptive Brain-Computer Interface	105
<i>Abdul Satti, Cuntai Guan, Damien Coyle, and Girijesh Prasad</i>	
A Probabilistic Language Model for Hand Drawings	109
<i>Abdullah Akce and Timothy Bretl</i>	
AR-PCA-HMM Approach for Sensorimotor Task Classification in EEG-based Brain-Computer Interfaces	113
<i>Ali Özgür Argunşah and Müjdat Çetin</i>	
Design, Implementation and Evaluation of a Real-Time P300-based Brain-Computer Interface System	117
<i>Armagan Amcalar and Mujdat Cetin</i>	

Video Classification and Retrieval

Motion-sketch Based Video Retrieval Using a Trellis Levenshtein Distance	121
<i>Rui Hu and John Collomosse</i>	
Extracting Key Sub-trajectory Features for Supervised Tactic Detection in Sports Video	125
<i>Yi Zhang, Changsheng Xu, and Hanqing Lu</i>	
A New Symmetry Based on Proximity of Wavelet-Moments for Text Frame Classification in Video	129
<i>Palaiahnakote Shivakumara, Anjan Dutta, Chew Lim Tan, and Umapada Pal</i>	
Edge Based Binarization for Video Text Images	133
<i>Zhou Zhiwei, Li Linlin, and Tan Chew Lim</i>	
Detecting Group Turn Patterns in Conversations Using Audio-Video Change Scale-Space	137
<i>RaviKiran Krishnan and Sudeep Sarkar</i>	

Tracking and Surveillance I

Improved Shadow Removal for Robust Person Tracking in Surveillance Scenarios	141
<i>Andres Sanin, Conrad Sanderson, and Brian C. Lovell</i>	
Multi-Cue Integration for Multi-Camera Tracking	145
<i>Kuan-Wen Chen and Yi-Ping Hung</i>	

Learning Pedestrian Trajectories with Kernels	149
<i>Elisa Ricci, Francesco Tobia, and Gloria Zen</i>	
Bag of Features Tracking	153
<i>Fan Yang, Huchuan Lu, and Yen-Wei Chen</i>	
Gradient Constraints Can Improve Displacement Expert Performance	157
<i>Philip A. Tresadern and Timothy F. Cootes</i>	
Dimensionality Reduction	
Temporal Extension of Laplacian Eigenmaps for Unsupervised Dimensionality Reduction of Time Series	161
<i>Michal Lewandowski, Jesus Martinez-del-Rincon, Dimitrios Makris, and Jean-Christophe Nebel</i>	
Orthogonal Locality Sensitive Fuzzy Discriminant Analysis in Sleep-Stage Scoring	165
<i>Rami N. Khushaba, Rosalind Elliott, Akram AlSukker, Ahmed Al-Ani, and Sharon McKinley</i>	
A Recursive Online Kernel PCA Algorithm	169
<i>Erion Hasanbelliu, Luis Sánchez Giraldo, and José C. Principe</i>	
Effective Dimensionality Reduction Based on Support Vector Machine	173
<i>Sangwoo Moon and Hairong Qi</i>	
Prototype Selection for Dissimilarity Representation by a Genetic Algorithm	177
<i>Yenisel Plasencia Calaña, Edel García Reyes, Mauricio Orozco Alzate, and Robert P.W. Duin</i>	
Motion and Multiple-View Vision II	
Multiple View Geometry for Non-rigid Motions Viewed from Curvilinear Motion Projective Cameras	181
<i>Cheng Wan and Jun Sato</i>	
Estimating Nonrigid Shape Deformation Using Moments	185
<i>Wei Liu and Eraldo Ribeiro</i>	
Optical Flow Estimation Using Diffusion Distances	189
<i>Szymon Wartak and Adrian G. Bors</i>	
Novel Multi View Structure Estimation Based on Barycentric Coordinates	193
<i>Matthias Rüther and Horst Bischof</i>	
Estimation of Non-rigid Surface Deformation Using Developable Surface Model	197
<i>Yoshihiro Watanabe, Takashi Nakashima, Takashi Komuro, and Masatoshi Ishikawa</i>	
Ocular Biometrics	
On the Fusion of Periocular and Iris Biometrics in Non-ideal Imagery	201
<i>Damon L. Woodard, Shrinivas Pundlik, Philip Miller, Raghavender Jillela, and Arun Ross</i>	

Computer Aided Detection and Diagnosis

Dyslexia Diagnostics by Centerline-Based Shape Analysis of the Corpus Callosum	261
<i>Ahmed Elnakib, Ayman El-Baz, Manuel F. Casanova, and Andrew E. Switala</i>	
A Probabilistic Information Fusion Approach to MR-based Automated Diagnosis of Dementia	265
<i>Ceyhun Burak Akgul and Ahmet Ekin</i>	
Two-Level Algorithm for MCs Detection in Mammograms Using Diverse-Adaboost-SVM	269
<i>Farshad Harirchi, Parham Radparvar, Hamid Abrishami Moghaddam, Faramarz Dehghan, and Masoumeh Giti</i>	
An Image Analysis Approach for Detecting Malignant Cells in Digitized H&E-stained Histology Images of Follicular Lymphoma	273
<i>Olca Sertel, Umit V. Catalyurek, Gerard Lozanski, Arwa Shanaah, and Metin N. Gurcan</i>	
Microaneurysm (MA) Detection via Sparse Representation Classifier with MA and Non-MA Dictionary Learning	277
<i>Bob Zhang, Lei Zhang, Jane You, and Fakhri Karray</i>	

Object Detection and Recognition: Performance Evaluation of Computer Vision Algorithms; Computer Vision Application

A Neurobiologically Motivated Stochastic Method for Analysis of Human Activities in Video	281
<i>Ricky J. Sethi and Amit K. Roy-Chowdhury</i>	
Arbitrary Stereoscopic View Generation Using Multiple Omnidirectional Image Sequences	286
<i>Maiya Hori, Masayuki Kanbara, and Naokazu Yokoya</i>	
Fast Odometry Integration in Local Bundle Adjustment-Based Visual SLAM	290
<i>Alexandre Eudes, Maxime Lhuillier, Sylvie Naudet-Collette, and Michel Dhome</i>	
Classifying Textile Designs Using Bags of Shapes	294
<i>Wei Jia and Stephen James McKenna</i>	
Driver Body-Height Prediction for an Ergonomically Optimized Ingress Using a Single Omnidirectional Camera	298
<i>Christian Scharfenberger, Samarjit Chakraborty, and Georg Färber</i>	
Torchlight Navigation	302
<i>Michael Felsberg, Fredrik Larsson, Wang Han, Anders Ynnerman, and Thomas B. Schön</i>	
Adaptive Image Projection onto Non-planar Screen Using Projector-Camera Systems	307
<i>Takashi Yamanaka, Fumihiko Sakaue, and Jun Sato</i>	
Analysis and Adaptation of Integration Time in PMD Camera for Visual Servoing	311
<i>Pablo Gil, Jorge Pomares, and Fernando Torres</i>	

Detecting Paper Fibre Cross Sections in Microtomy Images	316
<i>Peter Kontschieder, Michael Donoser, Johannes Kritzing, Wolfgang Bauer, and Horst Bischof</i>	
Active Calibration of Camera-Projector Systems Based on Planar Homography	320
<i>Soon-Yong Park and Go Gwang Park</i>	
Abnormal Traffic Detection Using Intelligent Driver Model	324
<i>Waqas Sultani and Jin Young Choi</i>	
Detection of Moving Objects with Removal of Cast Shadows and Periodic Changes Using Stereo Vision	328
<i>Alessandro Moro, Kenji Terabayashi, and Kazunori Umeda</i>	
Localized Image Matte Evaluation by Gradient Correlation	332
<i>Guilin Yao, Hongxun Yao, and Qingming Huang</i>	
Multiple Plane Detection in Image Pairs Using J-Linkage	336
<i>David F. Fouhey, Daniel Scharstein, and Amy J. Briggs</i>	
Contextual Features for Head Pose Estimation in Football Games	340
<i>Andreas Launila and Josephine Sullivan</i>	
Coarse-To-Fine Multiclass Nested Cascades for Object Detection	344
<i>Rodrigo Verschae and Javier Ruiz-del-Solar</i>	
Visual SLAM with an Omnidirectional Camera	348
<i>Alejandro Rituerto, Luis Puig, and J.J. Guerrero</i>	
Shape Index SIFT: Range Image Recognition Using Local Features	352
<i>Neslihan Bayramoglu and A. Aydin Alatan</i>	
Windows Detection Using K-means in CIE-Lab Color Space	356
<i>Michal Recky and Franz Leberl</i>	
Robust Figure Extraction on Textured Background: A Game-Theoretic Approach	360
<i>Andrea Albarelli, Emanuele Rodolà, Alberto Cavallarin, and Andrea Torsello</i>	
Image Retrieval of First-Person Vision for Pedestrian Navigation in Urban Area	364
<i>Yoshinari Kameda and Yuichi Ohta</i>	
Unexpected Human Behavior Recognition in Image Sequences Using Multiple Features	368
<i>Andreas Zweng and Martin Kampel</i>	
Object Recognition Based on n-gram Expression of Human Actions	372
<i>Atsuhiko Kojima, Hiroshi Miki, and Koichi Kise</i>	
Unifying Approach for Fast License Plate Localization and Super-Resolution	376
<i>Chu Duc Nguyen, Mohsen Ardabilian, and Liming Chen</i>	
Dimensionality Reduction for Distributed Vision Systems Using Random Projection	380
<i>Vildana Sulić, Janez Perš, Matej Kristan, and Stanislav Kovačić</i>	

Sensor Fusion for Cooperative Head Localization	384
<i>Alberto Del Bimbo, Fabrizio Dini, Giuseppe Lisanti, and Federico Pernici</i>	
Shared Random Ferns for Efficient Detection of Multiple Categories	388
<i>Michael Villamizar, Francesc Moreno-Noguer, Juan Andrade-Cetto, and Alberto Sanfeliu</i>	
Age Recognition in the Wild	392
<i>Christian Bauckhage, Amirhossein Jahanbeka, and Christian Thureau</i>	
EKF-SLAM and Machine Learning Techniques for Visual Robot Navigation	396
<i>H. Casarrubias-Vargas, A. Petrilli-Barceló, and E. Bayro-Corrochano</i>	
Boosting Clusters of Samples for Sequence Matching in Camera Networks	400
<i>Valtteri Takala, Yinghao Cai, and Matti Pietikäinen</i>	
Saliency Detection and Object Localization in Indoor Environments	404
<i>Maja Rudinac and Pieter P. Jonker</i>	
Bubble Tag Identification Using an Invariant–Under–Perspective Signature	408
<i>Viorica Pătrăucean, Pierre Gurdjos, and Jean Conter</i>	
The Role of Polarity in Haar-like Features for Face Detection	412
<i>Iago Landesa-Vázquez and José Luis Alba-Castro</i>	
A Human Detection Framework for Heavy Machinery	416
<i>Teuvo Antero Heimonen and Janne Heikkilä</i>	
Building a Videorama with Shallow Depth of Field	420
<i>Soonmin Bae and Hao Jiang</i>	
Fast Training of Object Detection Using Stochastic Gradient Descent	424
<i>R.G.J. Wijnhoven and P.H.N. de With</i>	
Assessing Water Quality by Video Monitoring Fish Swimming Behavior	428
<i>Carlos Serra-Toro, Raúl Montoliu, V. Javier Traver, Isabel M. Hurtado-Melgar, Manuela Núñez-Redó, and Pablo Cascales</i>	
Detecting Wires in Cluttered Urban Scenes Using a Gaussian Model	432
<i>Joshua Candamo, Dmitry Goldgof, Rangachar Kasturi, and Sridhar Godavarthy</i>	
Abandoned Objects Detection Using Double Illumination Invariant	
Foreground Masks	436
<i>Xuli Li, Chao Zhang, and Duo Zhang</i>	
Unsupervised Visual Object Categorisation via Self-organisation	440
<i>Teemu Kinnunen, Joni-Kristian Kamarainen, Lasse Lensu, and Heikki Kälviäinen</i>	
A Novel Shape Feature for Fast Region-Based Pedestrian Recognition	444
<i>Ali Shahrokni, Darren Gawley, and James Ferryman</i>	
Road Change Detection from Multi-Spectral Aerial Data	448
<i>Adriano Mancini, Emanuele Frontoni, and Primo Zingaretti</i>	
Object Recognition and Localization Via Spatial Instance Embedding	452
<i>Nazli Ikizler-Cinbis and Stan Sclaroff</i>	
Co-recognition of Actions in Video Pairs	456
<i>Young Min Shin, Minsu Cho, and Kyoung Mu Lee</i>	

Detecting Moving Objects Using a Camera on a Moving Platform	460
<i>Chung-Ching Lin and Marilyn Wolf</i>	
A Unified Probabilistic Approach to Feature Matching and Object Segmentation	464
<i>Tae Hoon Kim, Kyoung Mu Lee, and Sang Uk Lee</i>	
Automatic Restoration of Scratch in Old Archive	468
<i>Kyung-tai Kim, Byunggeun Kim, and Eun Yi Kim</i>	
Automatic Building Detection in Aerial Images Using a Hierarchical Feature Based Image Segmentation	472
<i>Mohammad Izadi and Parvaneh Saeedi</i>	
Making Visual Object Categorization More Challenging: Randomized Caltech-101 Data Set	476
<i>Teemu Kinnunen, Joni-Kristian Kamarainen, Lasse Lensu, Jukka Lankinen, and Heikki Kälviäinen</i>	
A Reliability Assessment Paradigm for Automated Video Tracking Systems	480
<i>Chung-Hao Chen, Yi Yao, Andreas Koschan, and Mongi Abidi</i>	
Road Sign Detection in Images: A Case Study	484
<i>Rachid Belaroussi, Philippe Foucher, Jean-Philippe Tarel, Bahman Soheilian, Pierre Charbonnier, and Nicolas Paparoditis</i>	
ImageCLEF@ICPR Contest: Challenges, Methodologies and Results of the Photo Annotation Task	489
<i>Stefanie Nowak</i>	
Task-Oriented Evaluation of Super-Resolution Techniques	493
<i>Li Tian, Akira Suzuki, and Hideki Koike</i>	
FeEval—A Dataset for Evaluation of Spatio-temporal Local Features	499
<i>Julian Stöttinger, Sebastian Zambanini, Rehanullah Khan, and Allan Hanbury</i>	
Performance Evaluation Tools for Zone Segmentation and Classification (PETS)	503
<i>Wontaek Seo, Mudit Agrawal, and David Doermann</i>	
Feature Extraction Classification; Clustering; Bayesian Methods	
Shape Filling Rate for Silhouette Representation and Recognition	507
<i>An Guocheng, Zhang Fengjun, Wang Hong'an, and Dai Guozhong</i>	
Learning GMM Using Elliptically Contoured Distributions	511
<i>Bo Li, Wenju Liu, and Lihua Dou</i>	
FIND: A Neat Flip Invariant Descriptor	515
<i>Xiaojie Guo and Xiaochun Cao</i>	
Matching Image with Multiple Local Features	519
<i>Yudong Cao, Honggang Zhang, Yanyan Gao, Xiaojun Xu, and Jun Guo</i>	
Lipreading: A Graph Embedding Approach	523
<i>Ziheng Zhou, Guoying Zhao, and Matti Pietikäinen</i>	

Face Recognition Using a Multi-manifold Discriminant Analysis Method	527
<i>Wankou Yang, Changyin Sun, and Lei Zhang</i>	
Globally-Preserving Based Locally Linear Embedding	531
<i>Kanghua Hui, Chunheng Wang, and Baihua Xiao</i>	
3D Human Pose Estimation by an Annealed Two-Stage Inference Method	535
<i>Yuan-Kai Wang and Kuang-You Cheng</i>	
Extended Locality Preserving Discriminant Analysis for Face Recognition	539
<i>Liping Yang, Weiguo Gong, and Xiaohua Gu</i>	
Beyond “Near Duplicates”: Learning Hash Codes for Efficient Similar-Image Retrieval	543
<i>Shumeet Baluja and Michele Covell</i>	
Rare Class Classification by Support Vector Machine	548
<i>He He and Ali Ghodsi</i>	
Package Boosting for Readaption of Cascaded Classifiers	552
<i>Magdalena Szczot, Julian Forster, Otto Löhlein, and Günther Palm</i>	
Baby-Posture Classification from Pressure-Sensor Data	556
<i>Sabri Boughorbel, Fons Bruekers, and Jeroen Breebaart</i>	
Vector Quantization Mappings for Speaker Verification	560
<i>Anthony Brew and Pádraig Cunningham</i>	
Maximum Entropy Model Based Classification with Feature Selection	565
<i>Ambedkar Dukkipati, Abhay Kumar Yadav, and M. Narasimha Murty</i>	
Dimensionality Reduction by Minimal Distance Maximization	569
<i>Bo Xu, Kaizhu Huang, and Cheng-Lin Liu</i>	
Possibilistic Clustering Based on Robust Modeling of Finite Generalized Dirichlet Mixture	573
<i>M. Maher Ben Ismail and Hichem Frigui</i>	
Cluster-Pairwise Discriminant Analysis	577
<i>Yasushi Makihara and Yasushi Yagi</i>	
Online Discriminative Kernel Density Estimation	581
<i>Matej Kristan and Aleš Leonardis</i>	
Local Outlier Detection Based on Kernel Regression	585
<i>Jun Gao, Weiming Hu, Wei Li, Zhongfei(Mark) Zhang, and Ou Wu</i>	
Verification Under Increasing Dimensionality	589
<i>Anne Hendrikse, Raymond Veldhuis, and Luuk Spreeuwiers</i>	
Discriminant Feature Manifold for Facial Aging Estimation	593
<i>Hui Fang, Phil Grant, and Min Chen</i>	
Tensor Voting Based Color Clustering	597
<i>Toan Nguyen Dinh, Jonghyun Park, Chilwoo Lee, and Gueesang Lee</i>	
An Improved Structural EM to Learn Dynamic Bayesian Nets	601
<i>Cassio P. de Campos, Zhi Zeng, and Qiang Ji</i>	

Gaussian Process Learning from Order Relationships Using Expectation Propagation	605
<i>Ruixuan Wang and Stephen James McKenna</i>	
Feature Ranking Based on Decision Border	609
<i>Claudia Diamantini, Alberto Gemelli, and Domenico Potena</i>	
Three-layer Spatial Sparse Coding for Image Classification	613
<i>Dengxin Dai, Wen Yang, and Tianfu Wu</i>	
Theoretical Analysis of a Performance Measure for Imbalanced Data	617
<i>V. García, Ramon A. Mollineda, and J. Salvador Sánchez</i>	
Cluster Preserving Embedding	621
<i>Yubin Zhan and Jianping Yin</i>	
Color Image Analysis by Quaternion Zernike Moments	625
<i>Beijing Chen, Huazhong Shu, Hui Zhang, Gang Chen, and Limin Luo</i>	
Topic-Sensitive Tag Ranking	629
<i>Yan'an Jin, Ruixuan Li, Zhengding Lu, Kunmei Wen, and Xiwu Gu</i>	
Water Reflection Detection Using a Flip Invariant Shape Detector	633
<i>Hua Zhang, Xiaojie Guo, and Xiaochun Cao</i>	
CDP Mixture Models for Data Clustering	637
<i>Yangfeng Ji, Tong Lin, and Hongbin Zha</i>	
A Simple Approach to Find the Best Wavelet Basis in Classification Problems	641
<i>Farhad Faradji, Rabab K. Ward, and Gary E. Birch</i>	
Learning Probabilistic Models of Contours	645
<i>Laure Amate and Maria João Rendas</i>	
Local Sparse Representation Based Classification	649
<i>Chun-Guang Li, Jun Guo, and Hong-Gang Zhang</i>	
Manifold Modeling with Learned Distance in Random Projection Space for Face Recognition	653
<i>Grigorios Tsagkatakis and Andreas Savakis</i>	
Part Detection, Description and Selection Based on Hidden Conditional Random Fields	657
<i>Wenhao Lu, Shengjin Wang, and Xiaoqing Ding</i>	
Boosting Bayesian MAP Classification	661
<i>Paolo Piro, Richard Nock, Frank Nielsen, and Michel Barlaud</i>	
Weighting of the k-Nearest-Neighbors	666
<i>Konstantin Chernoff and Mads Nielsen</i>	
Learning Sparse Face Features: Application to Face Verification	670
<i>Pierre Buyssens and Marinette Revenu</i>	
Image Feature Extraction Using 2D Mel-Cepstrum	674
<i>Serdar Çakir and A. Enis Çetin</i>	
Entropy Estimation and Multi-Dimensional Scale Saliency	678
<i>Pablo Suau and Francisco Escolano</i>	

A Novel Facial Localization for Three-dimensional Face Using Multi-level Partition of Unity Implicits	682
<i>Yuan Hu, Jingqi Yan, Wei Li, and Pengfei Shi</i>	
Automated Feature Weighting in Fuzzy Declustering-based Vector Quantization	686
<i>Theam Foo Ng, Tuan D. Pham, and Changming Sun</i>	
A Discriminative and Heteroscedastic Linear Feature Transformation for Multiclass Classification	690
<i>Hung-Shin Lee, Hsin-Min Wang, and Berlin Chen</i>	
Sparse Representation Classifier Steered Discriminative Projection	694
<i>Jian Yang and Delin Chu</i>	
Designing a Pattern Stabilization Method Using Scleral Blood Vessels for Laser Eye Surgery	698
<i>Aydin Kaya, Ahmet Burak Can, and Hasan Basri Cakmak</i>	
Aggregation of Probabilistic PCA Mixtures with a Variational-Bayes Technique Over Parameters	702
<i>Pierrick Bruneau, Marc Gelgon, and Fabien Picarougne</i>	
Kernel Uncorrelated Adjacent-class Discriminant Analysis	706
<i>Xiaoyuan Jing, Sheng Li, Yongfang Yao, Lusha Bian, and Jingyu Yang</i>	
A Meta-Learning Approach to Conditional Random Fields Using Error-Correcting Output Codes	710
<i>Francesco Ciompi, Oriol Pujol, and Petia Radeva</i>	
Statistical Modeling of Image Degradation Based on Quality Metrics	714
<i>Aladine Chetouani, Azeddine Beghdadi, and Mohamed Deriche</i>	
Performance Evaluation of Automatic Feature Discovery Focused within Error Clusters	718
<i>Sui-Yu Wang and Henry S. Baird</i>	
Optimized Entropy-constrained Vector Quantization of lossy Vector Map Compression	722
<i>Minjie Chen, Mantao Xu, and Pasi Fränti</i>	
Nonnegative Embeddings and Projections for Dimensionality Reduction and Information Visualization	726
<i>Stefanos Zafeiriou and Nikolaos Laskaris</i>	
Unsupervised Learning from Linked Documents	730
<i>Zhen Guo, Shenghuo Zhu, Yun Chi, Zhongfei Zhang, and Yihong Gong</i>	
Tensor Power Method for Efficient MAP Inference in Higher-order MRFs	734
<i>Dimitri Semenovitch and Arcot Sowmya</i>	
Detection and Characterization of Anomalous Entities in Social Communication Networks	738
<i>Nithi Gupta and Lipika Dey</i>	

Mahalanobis-based Adaptive Nonlinear Dimension Reduction	742
<i>Djamila Aouada, Yuliy Baryshnikov, and Hamid Krim</i>	
Maximum Likelihood Estimation of Gaussian Mixture Models Using Particle Swarm Optimization	746
<i>Çağlar Arı and Selim Aksoy</i>	
Object Discovery by Clustering Correlated Visual Word Sets	750
<i>Gibran Fuentes Pineda, Hisashi Koga, and Toshinori Watanabe</i>	

Object Detection and Recognition I

Learning an Efficient and Robust Graph Matching Procedure for Specific Object Recognition	754
<i>Jerome Revaud, Guillaume Lavoué, Yasuo Ariki, and Atilla Baskurt</i>	
A New Biologically Inspired Feature for Scene Image Classification	758
<i>Aiweng Jiang, Chunheng Wang, Baihua Xiao, and Ruwei Dai</i>	
On a Quest for Image Descriptors Based on Unsupervised Segmentation Maps	762
<i>Piotr Koniusz and Krystian Mikolajczyk</i>	
An RST-Tolerant Shape Descriptor for Object Detection	766
<i>Chih-Wen Su, Hong-Yuan Mark Liao, Yu-Ming Liang, and Hsiao-Rong Tyan</i>	
Inverse Multiple Instance Learning for Classifier Grids	770
<i>Sabine Sternig, Peter M. Roth, and Horst Bischof</i>	

Clustering

On Dynamic Weighting of Data in Clustering with K-Alpha Means	774
<i>Si-Bao Chen, Hai-Xian Wang, and Bin Luo</i>	
ARImp: A Generalized Adjusted Rand Index for Cluster Ensembles	778
<i>Shaohong Zhang and Hau-San Wong</i>	
On the Scalability of Evidence Accumulation Clustering	782
<i>André Lourenço, Ana L.N. Fred, and Anil K. Jain</i>	
A Hierarchical Clustering Method for Color Quantization	786
<i>Jun Zhang and Jinglu Hu</i>	
Combining Real and Virtual Graphs to Enhance Data Clustering	790
<i>Liang Wang, Christopher Leckie, and Ramamohanarao Kotagiri</i>	

3D Shape Recovery

Calibration Method for Line Structured Light Vision Sensor Based on Vanish Points and Lines	794
<i>Zhenzhong Wei, Meng Xie, and Guangjun Zhang</i>	
A Color Invariant Based Binary Coded Structured Light Range Scanner for Shiny Objects	798
<i>Rifat Benveniste and Cem Ünsalan</i>	
Improving Shape-from-Focus by Compensating for Image Magnification Shift	802
<i>Said Pertuz, Domenec Puig, and Miguel Angel Garcia</i>	

Quasi-dense Wide Baseline Matching for Three Views	806
<i>Pekka Koskenkorva, Juho Kannala, and Sami S. Brandt</i>	
Robust Shape from Polarisation and Shading	810
<i>Cong Phuoc Huynh, Antonio Robles-Kelly, and Edwin Hancock</i>	

Signal Separation and Classification

Classifying Three-way Seismic Volcanic Data by Dissimilarity Representation	814
<i>Diana Porro-Muñoz, Robert P.W. Duin, Mauricio Orozco-Alzate, Isneri Talavera, and John Makario Londoño-Bonilla</i>	
Improved Blur Insensitivity for Decorrelated Local Phase Quantization	818
<i>Janne Heikkilä, Ville Ojansivu, and Esa Rahtu</i>	
Ensemble Discriminant Sparse Projections Applied to Music Genre Classification	822
<i>Constantine Kotropoulos, Gonzalo R. Arce, and Yannis Panagakis</i>	
Single Channel Speech Separation Using Source-Filter Representation	826
<i>Michael Stark, Michael Wohlmayr, and Franz Pernkopf</i>	
Nonlinear Blind Source Separation Using Slow Feature Analysis with Random Features	830
<i>Kuijun Ma, Qing Tao, and Jue Wang</i>	

Image Analysis III

Canonical Image Selection by Visual Context Learning	834
<i>Wengang Zhou, Yijuan Lu, Houqiang Li, and Qi Tian</i>	
Exposing Digital Image Forgeries by Using Canonical Correlation Analysis	838
<i>Chi Zhang and Hongbin Zhang</i>	
Adding Affine Invariant Geometric Constraint for Partial-Duplicate Image Retrieval	842
<i>Zipeng Wu, Qianqian Xu, Shuqiang Jiang, Qingming Huang, Peng Cui, and Liang Li</i>	
Outlier-Resistant Dissimilarity Measure for Feature-based Image Matching	846
<i>Roman M. Palenichka, Ahmed Lakhssassi, and Marek B. Zaremba</i>	
The University of Surrey Visual Concept Detection System at ImageCLEF@ICPR: Working Notes	850
<i>Muhammad Atif Tahir, Fei Yan, Mark Barnard, Muhammad Awais, Krystian Mikołajczyk, and Josef Kittler</i>	

Texture

On Adapting Pixel-based Classification to Unsupervised Texture Segmentation	854
<i>Jaime Melendez, Domenec Puig, and Miguel Angel Garcia</i>	
Natural Material Recognition with Illumination Invariant Textural Features	858
<i>Pavel Vácha and Michal Haindl</i>	

Gaze-Motivated Compression of Illumination and View Dependent Textures	862
<i>Jiri Filip, Michal Haendl, and Michael J. Chantler</i>	
Perceptual Color Texture Codebooks for Retrieving in Highly Diverse Texture Datasets	866
<i>Susana Alvarez, Anna Salvatella, Maria Vanrell, and Xavier Otazu</i>	
Illumination Estimation of 3D Surface Texture Based on Active Basis	870
<i>Junyu Dong, Liyuan Su, and Yuanxu Duan</i>	
Security and Privacy	
Binary Discriminant Analysis for Face Template Protection	874
<i>Yi C. Feng and Pong C. Yuen</i>	
Renewable Minutiae Templates with Tunable Size and Security	878
<i>Bian Yang, Christoph Busch, Davrondzhon Gafurov, and Patrick Bours</i>	
Tokenless Cancelable Biometrics Scheme for Protecting Iris Codes	882
<i>Osama Ouda, Norimichi Tsumura, and Toshiya Nakaguchi</i>	
A Novel Fingerprint Template Protection Scheme Based on Distance Projection Coding	886
<i>Ruifang Wang, Xin Yang, Xia Liu, Sujing Zhou, Peng Li, Kai Cao, and Jie Tian</i>	
Combination of Symmetric Hash Functions for Secure Fingerprint Matching	890
<i>Gaurav Kumar, Sergey Tulyakov, and Venu Govindaraju</i>	
Structural Methods and Speech/Image Analysis	
Face Recognition Based on Illumination Adaptive LDA	894
<i>Zhonghua Liu, Jingbo Zhou, and Zhong Jin</i>	
Topological Dynamic Bayesian Networks	898
<i>Djamel Bouchaffra</i>	
Vector Space Embedding of Undirected Graphs with Fixed-cardinality Vertex Sequences for Classification	902
<i>Jonas Richiardi, Dimitri Van De Ville, Kaspar Riesen, and Horst Bunke</i>	
Hierarchical Large Margin Nearest Neighbor Classification	906
<i>Qiaona Chen and Shiliang Sun</i>	
Adapting Information Theoretic Clustering to Binary Images	910
<i>Christian Bauckhage and Christian Thureau</i>	
Nearest-Manifold Classification with Gaussian Processes	914
<i>Goo Jun and Joydeep Ghosh</i>	
Mining Exemplars for Object Modelling Using Affinity Propagation	918
<i>Shengping Xia, Jianjun Liu, and Edwin Hancock</i>	
Background Filtering for Improving of Object Detection in Images	922
<i>Ge Qin, Bogdan Vrusias, and Lee Gillam</i>	
Sparse Local Discriminant Projections for Feature Extraction	926
<i>Zhihui Lai, Zhong Jin, Jian Yang, and W.K Wong</i>	

Information-theoretic Feature Selection from Unattributed Graphs	930
<i>Boyan Bonev, Francisco Escolano, Daniela Giorgi, and Silvia Biasotti</i>	
Head Pose Estimation Based on Random Forests for Multiclass Classification	934
<i>Chen Huang, Xiaoqing Ding, and Chi Fang</i>	
Differential Morphological Decomposition Segmentation: A Multi-Scale	
Object Based Image Description	938
<i>Lionel Gueguen, Pierre Soille, and Martino Pesaresi</i>	
Efficient Learning to Label Images	942
<i>Ke Jia, Li Cheng, Nianjun Liu, and Lei Wang</i>	
NAVIDOMASS: Structural-based Approaches Towards Handling Historical	
Documents	946
<i>Salim Jouili, Mickaël Coustaty, Salvatore Tabbone, and Jean-Marc Ogier</i>	
Median Graph Shift: A New Clustering Algorithm for Graph Domain	950
<i>Salim Jouili, Salvatore Tabbone, and Vinciane Lacroix</i>	
A Discrete Labelling Approach to Attributed Graph Matching Using SIFT	
Features	954
<i>Gerard Sanromà, René Alquézar, and Francesc Serratosa</i>	
A Conductance Electrical Model for Representing and Matching Weighted	
Undirected Graphs	958
<i>Manuel Igelmo, Alberto Sanfeliu, and Miquel Ferrer</i>	
Computing the Barycenter Graph by Means of the Graph Edit Distance	962
<i>Itziar Bardaji, Miquel Ferrer, and Alberto Sanfeliu</i>	
Refined Morphological Methods of Moment Computation	966
<i>Tomáš Suk and Jan Flusser</i>	
Robust Computation of the Polarisation Image	971
<i>Gule Saman and Edwin R. Hancock</i>	
Fast Polar and Spherical Fourier Descriptors for Feature Extraction	975
<i>Zhuo Yang and Sei-ichiro Kamata</i>	
RBM-based Silhouette Encoding for Human Action Modelling	979
<i>Manuel J. Marín-Jiménez, Nicolás Pérez de la Blanca, and M. Ángeles Mendoza</i>	
Shape Classification Using Tree -Unions	983
<i>Bo Wang, Wei Shen, Wenyu Liu, Xinge You, and Xiang Bai</i>	
Sparse Coding of Linear Dynamical Systems with an Application to Dynamic	
Texture Recognition	987
<i>Bernard Ghanem and Narendra Ahuja</i>	
Background Modeling by Combining Joint Intensity Histogram	
with Time-sequential Data	991
<i>Yasuyo Kita</i>	
2LDA: Segmentation for Recognition	995
<i>Alessandro Perina, Marco Cristani, and Vittorio Murino</i>	

Modeling and Generalization of Discrete Morse Terrain Decompositions	999
<i>Leila De Floriani, Paola Magillo, and Maria Vitali</i>	
Region Description Using Extended Local Ternary Patterns	1003
<i>Wen-Hung Liao</i>	
A Novel Multi-view Agglomerative Clustering Algorithm Based on Ensemble of Partitions on Different Views	1007
<i>Hamidreza Mirzaei</i>	
Hydroacoustic Signal Classification Using Kernel Functions for Variable Feature Sets	1011
<i>Matthias Tuma, Christian Igel, and Mark Prior</i>	
Large Margin Discriminant Hashing for Fast k-Nearest Neighbor Classification	1015
<i>Tomoyuki Shibata, Susumu Kubota, and Satoshi Ito</i>	
Robust Frame-to-Frame Hybrid Matching	1019
<i>Lei Chen, Z.L. Wang, and Yunde Jia</i>	
A Fast Extension for Sparse Representation on Robust Face Recognition	1023
<i>Hui-ning Qiu, Duc-Son Pham, Svetha Venkatesh, Wan-quan Liu, and Jian-huang Lai</i>	
A MANOVA of Major Factors of RIU-LBP Feature for Face Recognition	1028
<i>Jie Luo, Yuchun Fang, and Qiyun Cai</i>	
Consistent Estimator of Median and Mean Graph	1032
<i>Brijnesh Jain and Klaus Obermayer</i>	
Efficient Encoding of n-D Combinatorial Pyramids	1036
<i>Sébastien Fourey and Luc Brun</i>	
View-Invariant Object Recognition with Visibility Maps	1040
<i>Bisser Raytchev, Tetsuya Mino, Toru Tamaki, and Kazufumi Kaneda</i>	
Normalized Sum-over-Paths Edit Distances	1044
<i>Silvia García Díez, François Fouss, Masashi Shimbo, and Marco Saerens</i>	
Effective Multi-level Image Representation for Image Categorization	1048
<i>Hao Li and Yuxin Peng</i>	
Classification of Volcano Events Observed by Multiple Seismic Stations	1052
<i>Robert P.W. Duin, Mauricio Orozco-Alzate, and John Makario Londono-Bonilla</i>	
A Variational Bayesian EM Algorithm for Tree Similarity	1056
<i>Atsuhiko Takasu, Daiji Fukagawa, and Tatsuya Akutsu</i>	
Enhancing Image Classification with Class-wise Clustered Vocabularies	1060
<i>Wojciech Wojcikiewicz, Alexander Binder, and Motoaki Kawanabe</i>	
Efficiently Computing Optimal Consensus of Digital Line Fitting	1064
<i>Yukiko Kenmochi, Lilian Buzer, and Hugues Talbot</i>	
Learning a Joint Manifold Representation from Multiple Data Sets	1068
<i>Marwan Torki, Ahmed Elgammal, and Chan Su Lee</i>	
A Multi-scale Approach to Decompose a Digital Curve into Meaningful Parts	1072
<i>Thanh Phuong Nguyen and Isabelle Debled-Rennesson</i>	

A Memetic Algorithm for Selection of 3D Clustered Features with Applications in Neuroscience	1076
<i>Malin Björnsdotter and Johan Wessberg</i>	
Pose Estimation of Known Objects by Efficient Silhouette Matching	1080
<i>Christian Reinbacher, Matthias Rüther, and Horst Bischof</i>	
Learning Non-linear Dynamical Systems by Alignment of Local Linear Models	1084
<i>Masao Joko, Yoshinobu Kawahara, and Takehisa Yairi</i>	
A Column Generation Approach for the Graph Matching Problem	1088
<i>A.S. Freire, R.M. Cesar Jr., and C.E. Ferreira</i>	
Pattern Recognition Using Functions of Multiple Instances	1092
<i>Alina Zare and Paul Gader</i>	
Linear Decomposition of Planar Shapes	1096
<i>Alexandre Faure and Fabien Feschet</i>	
Sketched Symbol Recognition with a Latent-Dynamic Conditional Model	1100
<i>Vincenzo Deufemia, Michele Risi, and Genoveffa Tortora</i>	
Canonical Patterns of Oriented Topologies	1104
<i>Walter C. Mankowski, Ali Shokoufandeh, and Dario D. Salvucci</i>	
Hierarchical Anomaly Detection Based on Situation	1108
<i>Shuichi Nishio, Hiromi Okamoto, and Noboru Babaguchi</i>	
Image Classification Using Subgraph Histogram Representation	1112
<i>Bahadir Özdemir and Selim Aksoy</i>	
Oriented Boundary Graph: A Framework to Design and Implement 3D Segmentation Algorithms	1116
<i>Fabien Baldacci, Achille Braquelaire, and Jean-Philippe Domenger</i>	
Hierarchical Segmentation of Complex Structures	1120
<i>Huseyin Gökhan Akçay, Selim Aksoy, and Pierre Soille</i>	

Biometrics

Image Specific Error Rate: A Biometric Performance Metric	1124
<i>Elham Tabassi</i>	
Low Cost and Usable Multimodal Biometric System Based on Keystroke Dynamics and 2D Face Recognition	1128
<i>Romain Giot, Baptiste Hemery, and Christophe Rosenberger</i>	
Parallel versus Hierarchical Fusion of Extended Fingerprint Features	1132
<i>Qijun Zhao, Feng Liu, Lei Zhang, and David Zhang</i>	
Feature Band Selection for Multispectral Palmprint Recognition	1136
<i>Zhenhau Guo, Lei Zhang, and David Zhang</i>	
Automatic Gender Recognition Using Fusion of Facial Strips	1140
<i>Ping-Han Lee, Jui-Yu Hung, and Yi-Ping Hung</i>	

Benchmarking Local Orientation Extraction in Fingerprint Recognition	1144
<i>Raffaele Cappelli, Davide Maltoni, and Francesco Turrone</i>	
Efficient Finger Vein Localization and Recognition	1148
<i>Jinfeng Yang and Xu Li</i>	
Learning the Relationship Between High and Low Resolution Images in Kernel Space for Face Super Resolution	1152
<i>Wilman W.W. Zou and Pong C. Yuen</i>	
Robust Regression for Face Recognition	1156
<i>Imran Naseem, Roberto Togneri, and Mohammed Bennamoun</i>	
Recognition of Blurred Faces via Facial Deblurring Combined with Blur-Tolerant Descriptors	1160
<i>Abdenour Hadid, Masashi Nishiyama, and Yoichi Sato</i>	
Diffusion-Based Face Selective Smoothing in DCT Domain to Illumination Invariant Face Recognition	1164
<i>Mehdi Ezoji and Karim Faez</i>	
Biohashing for Securing Minutiae Template	1168
<i>Rima Belguechi, Christophe Rosenberger, and Samy Ait Aoudia</i>	
Fusion of an Isometric Deformation Modeling Approach Using Spectral Decomposition and a Region-Based Approach Using ICP for Expression-Invariant 3D Face Recognition	1172
<i>Dirk Smeets, Thomas Fabry, Jeroen Hermans, Dirk Vandermeulen, and Paul Suetens</i>	
Towards a Best Linear Combination for Multimodal Biometric Fusion	1176
<i>Chaw Chia, Nasser Sherkat, and Lars Nolle</i>	
Slap Fingerprint Segmentation for Live-Scan Devices and Ten-Print Cards	1180
<i>Yong-Liang Zhang, Gang Xiao, Yan-Miao Li, Hong-Tao Wu, and Ya-Ping Huang</i>	
A Metric of Information Gained Through Biometric Systems	NA
<i>Kenta Takahashi and Takao Murakami</i>	
Probabilistic Measure for Signature Verification Based on Bayesian Learning	1188
<i>DanJun Pu and Sargur N. Srihari</i>	
Gender Classification Using Single Frontal Image Per Person: Combination of Appearance and Geometric Based Features	1192
<i>Saeed Mozaffari, Hamid Behravan, and Rohollah Akbari</i>	
Residual Analysis for Fingerprint Orientation Modeling	1196
<i>Suksan Jirachaweng, Zujun Hou, Jun Li, Wei-Yun Yau, and Vutipong Areekul</i>	
Dynamic Amelioration of Resolution Mismatches for Local Feature Based Identity Inference	1200
<i>Yongkang Wong, Conrad Sanderson, Sandra Mau, and Brian C. Lovell</i>	
Patch-Based Similarity HMMs for Face Recognition with a Single Reference Image	1204
<i>Ngoc-Son Vu and Alice Caplier</i>	

How to Control Acceptance Threshold for Biometric Signatures with Different Confidence Values?	1208
<i>Yasushi Makihara, Md. Altab Hossain, and Yasushi Yagi</i>	
Binary Representations of Fingerprint Spectral Minutiae Features	1212
<i>Haiyun Xu and Raymond N.J. Veldhuis</i>	
Attacking Iris Recognition: An Efficient Hill-Climbing Technique	1217
<i>Christian Rathgeb and Andreas Uhl</i>	
Face Recognition at-a-Distance Using Texture, Dense- and Sparse-Stereo Reconstruction	1221
<i>Ham M. Rara, Asem A. Ali, Shireen Y. Elhabian, Thomas L. Starr, and Aly A. Farag</i>	
Automatic Asymmetric 3D-2D Face Recognition	1225
<i>Di Huang, Mohsen Ardabilian, Yunhong Wang, and Liming Chen</i>	
Model and Score Adaptation for Biometric Systems: Coping With Device Interoperability and Changing Acquisition Conditions	1229
<i>Norman Poh, Josef Kittler, Sebastien Marcel, Driss Matrouf, and Jean-Francois Bonastre</i>	
Online Boosting OC for Face Recognition in Continuous Video Stream	1233
<i>Hongwen Huo and Jufu Feng</i>	
On the Dimensionality Reduction for Sparse Representation Based Face Recognition	1237
<i>Lei Zhang, Meng Yang, Zhizhao Feng, and David Zhang</i>	
Improved Fingerprint Image Segmentation and Reconstruction of Low Quality Areas	1241
<i>Krzysztof Mieloch, Axel Munk, and Preda Mihailescu</i>	
An Efficient Method for Offline Text Independent Writer Identification	1245
<i>Golnaz Ghiasi and Reza Safabakhsh</i>	
Study on Color Spaces for Single Image Enrolment Face Authentication	1249
<i>Baptiste Hemery, Jean-Jacques Schwartzmann, and Christophe Rosenberger</i>	
Estimation of Fingerprint Orientation Field by Weighted 2D Fourier Expansion Model	1253
<i>Xunqiang Tao, Xin Yang, Kai Cao, Ruifang Wang, Peng Li, and Jie Tian</i>	
Iterative Fingerprint Enhancement with Matched Filtering and Quality Diffusion in Spatial-Frequency Domain	1257
<i>Prawit Sutthiwichaiporn, Vutipong Areekul, and Suksan Jirachaweng</i>	
Cancelable Face Recognition Using Random Multiplicative Transform	1261
<i>Yongjin Wang and Dimitrios Hatzinakos</i>	
Evaluation of Multi-frame Fusion Based Face Classification Under Shadow	1265
<i>Shaun Canavan, Benjamin Johnson, Mike Reale, Yong Zhang, Lijun Yin, and John Sullins</i>	
Finger-Vein Authentication Based on Wide Line Detector and Pattern Normalization	1269
<i>Beining Huang, Yanggang Dai, Rongfeng Li, Darun Tang, and Wenxin Li</i>	

Performance Evaluation of Micropattern Representation on Gabor Features for Face Recognition	1273
<i>Sanqiang Zhao, Yongsheng Gao, and Baochang Zhang</i>	
Block Pyramid Based Adaptive Quantization Watermarking for Multimodal Biometric Authentication	1277
<i>Bin Ma, Chunlei Li, Yunhong Wang, Zhaoxiang Zhang, and Yiding Wang</i>	
A Topologic Approach to User-Dependent Key Extraction from Fingerprints	1281
<i>Vladimir Yu. Gudkov and Oleg Ushmaev</i>	
Robust Face Recognition Using Block-Based Bag of Words	1285
<i>Zisheng Li, Jun-ichi Imai, and Masahide Kaneko</i>	
Analysis of Fingerprint Pores for Vitality Detection	1289
<i>Gian Luca Marcialis, Fabio Roli, and Alessandra Tidu</i>	
Applying Dissimilarity Representation to Off-Line Signature Verification	1293
<i>Luana Batista, Eric Granger, and Robert Sabourin</i>	
3D Face Decomposition and Region Selection Against Expression Variations	1298
<i>Göksel Günlü and Hasan S. Bilge</i>	
Fusion of Qualities for Frame Selection in Video Face Verification	1302
<i>Mauricio Villegas and Roberto Paredes</i>	
A Person Retrieval Solution Using Finger Vein Patterns	1306
<i>Darun Tang, Beining Huang, Rongfeng Li, and Wenxin Li</i>	
Multi-classifier Q-stack Aging Model for Adult Face Verification	1310
<i>Weifeng Li and Andrzej Drygajlo</i>	
Quality-Based Fusion for Multichannel Iris Recognition	1314
<i>Mayank Vatsa, Richa Singh, Arun Ross, and Afzel Noore</i>	
Iris Image Retrieval Based on Macro-features	1318
<i>Manisha Sam Sunder and Arun Ross</i>	
A Gradient Descent Approach for Multi-modal Biometric Identification	1322
<i>Jayanta Basak, Kiran Kate, Vivek Tyagi, and Nalini Ratha</i>	
Robust ECG Biometrics by Fusing Temporal and Cepstral Information	1326
<i>Ming Li and Shrikanth Narayanan</i>	
A Comparative Study of Facial Landmark Localization Methods for Face Recognition Using HOG descriptors	1330
<i>David Monzo, Alberto Albiol, Antonio Albiol, and Jose M. Mossi</i>	
Confidence Weighted Subspace Projection Techniques for Robust Face Recognition in the Presence of Partial Occlusions	1334
<i>Vitimir Štruc, Simon Dobrišek, and Nikola Pavešić</i>	
Face Recognition Across Pose with Automatic Estimation of Pose Parameters through AAM-Based Landmarking	1339
<i>Lucía Teijeiro-Mosquera, José-Luis Alba-Castro, and Daniel González-Jiménez</i>	
Cross-Spectral Face Verification in the Short Wave Infrared (SWIR) Band	1343
<i>Thirimachos Bourlai, Nathan Kalka, Arun Ross, Bojan Cukic, and Lawrence Hornak</i>	

Decision Fusion for Patch-Based Face Recognition	1348
<i>Berkay Topçu and Hakan Erdogan</i>	
Video Based Palmprint Recognition	1352
<i>Chhaya Methani and Anoop M. Namboodiri</i>	
Profile Lip Reading for Vowel and Word Recognition	1356
<i>Takeshi Saitoh and Ryosuke Konishi</i>	
Image Analysis IV	
Joint Image GMM and Shading MAP Estimation	1360
<i>Alexander Shekhovtsov and Václav Hlavác</i>	
Continuous Markov Random Field Optimization Using Fusion Move Driven Markov Chain Monte Carlo Technique	1364
<i>Wonsik Kim and Kyoung Mu Lee</i>	
Approximate Belief Propagation by Hierarchical Averaging of Outgoing Messages	1368
<i>Koichi Ogawara</i>	
Cascaded Background Subtraction Using Block-Based and Pixel-Based Codebooks	1373
<i>Jing-Ming Guo and Chih-Sheng Hsu</i>	
Moving Cast Shadow Removal Based on Local Descriptors	1377
<i>Rui Qin, Shengcai Liao, Zhen Lei, and Stan Z. Li</i>	
Feature Extraction I	
Local Rotation Invariant Patch Descriptors for 3D Vector Fields	1381
<i>Janis Fehr</i>	
Anomaly Detection for Longwave FLIR Imagery Using Kernel Wavelet-RX	1385
<i>Asif Mehmood and Nasser M. Nasrabadi</i>	
Detection of Salient Image Points Using Principal Subspace Manifold Structure	1389
<i>António R.C. Paiva and Tolga Tasdizen</i>	
Triangle-Constraint for Finding More Good Features	1393
<i>Xiaojie Guo and Xiaochun Cao</i>	
Compressing Sparse Feature Vectors Using Random Ortho-Projections	1397
<i>Esa Rahtu, Mikko Salo, and Janne Heikkilä</i>	
Object Detection and Recognition II	
Learning Discriminative Features Based on Distribution	1401
<i>Jifeng Shen, Wankou Yang, and Changyin Sun</i>	
Sub-Category Optimization for Multi-view Multi-pose Object Detection	1405
<i>Dipankar Das, Yoshinori Kobayashi, and Yoshinori Kuno</i>	
Learning and Detection of Object Landmarks in Canonical Object Space	1409
<i>Joni-Kristian Kamarainen and Jarmo Ilonen</i>	

Multiple-Shot Person Re-identification by HPE Signature	1413
<i>Loris Bazzani, Marco Cristani, Alessandro Perina, Michela Farenzena, and Vittorio Murino</i>	
Building Detection in a Single Remotely Sensed Image with a Point Process of Rectangles	1417
<i>Csaba Benedek, Xavier Descombes, and Josiane Zerubia</i>	
Model Selection and Clustering	
A Relationship Between Generalization Error and Training Samples in Kernel Regressors	1421
<i>Akira Tanaka, Hideyuki Imai, Mineichi Kudo, and Masaaki Miyakoshi</i>	
Localized Multiple Kernel Regression	1425
<i>Mehmet Gönen and Ethem Alpaydin</i>	
Probabilistic Clustering Using the Baum-Eagon Inequality	1429
<i>Samuel Rota Bulò and Marcello Pelillo</i>	
Ensemble Clustering via Random Walker Consensus Strategy	1433
<i>Daniel Duarte Abdala, Pakaket Wattuya, and Xiaoyi Jiang</i>	
Bhattacharyya Clustering with Applications to Mixture Simplifications	1437
<i>Frank Nielsen, Sylvain Boltz, and Olivier Schwander</i>	
Watermarking and Authentication	
High Capacity Data Hiding for Binary Image Authentication	1441
<i>Meng Guo and Hongbin Zhang</i>	
Secure Self-Recovery Image Authentication Using Randomly-Sized Blocks	1445
<i>Ammar M. Hassan, Ayoub Al-Hamadi, Bernd Michaelis, Yassin M.Y. Hasan, and Mohamed A.A. Wahab</i>	
Blind Wavelet Based Logo Watermarking Resisting to Cropping	1449
<i>Mohammad Reza Soheili</i>	
The New Blockwise Algorithm for Large-Scale Images Robust Watermarking	1453
<i>Nikolay Ivanovich Glumov and Vitaly Anatolyevich Mitekin</i>	
Lossless ROI Medical Image Watermarking Technique with Enhanced Security and High Payload Embedding	1457
<i>Malay Kumar Kundu and Sudeb Das</i>	
Face Recognition I	
Efficient Facial Attribute Recognition with a Spatial Codebook	1461
<i>Yoshihisa Ijiri, Shihong Lao, Tony X. Han, and Hiroshi Murase</i>	
Feature Space Hausdorff Distance for Face Recognition	1465
<i>Shaokang Chen and Brian C. Lovell</i>	
How to Measure Biometric Information?	1469
<i>Yagiz Sutcu, Husrev T. Sencar, and Nasir Memon</i>	

Intensity-Based Congealing for Unsupervised Joint Image Alignment	1473
<i>Markus Storer, Martin Urschler, and Horst Bischof</i>	

An Illumination Quality Measure for Face Recognition	1477
<i>Dayron Rizo-Rodríguez, Heydi Méndez-Vázquez, and Edel García-Reyes</i>	

Biomedical Image Segmentation

Cascaded Segmentation of Grained Cell Tissue with Active Contour Models	1481
<i>Birgit Möller, Nadine Stöhr, Stefan Huettelmaier, and Stefan Posch</i>	

Live Cell Segmentation in Fluorescence Microscopy via Graph Cut	1485
<i>Milán Leskó, Zoltan Kato, Antal Nagy, Imre Gombos, Zsolt Török, László Vigh Jr, and László Vigh</i>	

Retinal Blood Vessels Segmentation Using the Radial Projection and Supervised Classification	1489
<i>Qinmu Peng, Xinge You, Long Zhou, and Yiu-ming Cheung</i>	

Deep Belief Networks for Real-Time Extraction of Tongue Contours from Ultrasound During Speech	1493
<i>Ian Fasel and Jeff Berry</i>	

Automated Gland Segmentation and Classification for Gleason Grading of Prostate Tissue Images	1497
<i>Kien Nguyen, Anil K. Jain, and Ronald L. Allen</i>	

Face Recognition II

Multi-resolution Local Appearance-Based Face Verification	1501
<i>Hua Gao, Hazim Kemal Ekenel, Mika Fischer, and Rainer Stiefelhagen</i>	

Partial Face Biometry Using Shape Decomposition on 2D Conformal Maps of Faces	1505
<i>Przemyslaw Szeptycki, Mohsen Ardabilian, Liming Chen, Wei Zeng, David Gu, and Dimitris Samaras</i>	

Gender Classification Using Interlaced Derivative Patterns	1509
<i>Ameneh Shobeirinejad and Yongsheng Gao</i>	

Heterogeneous Face Recognition: Matching NIR to Visible Light Images	1513
<i>Brendan Klare and Anil K. Jain</i>	

Clustering Face Carvings: Exploring the Devatas of Angkor Wat	1517
<i>Brendan Klare, Pavan Mallapragada, Anil K Jain, and Kent Davis</i>	

Feature Extraction II

Action Recognition Using Spatial-Temporal Context	1521
<i>Qiong Hu, Lei Qin, Qingming Huang, Shuqiang Jiang, and Qi Tian</i>	

Feature Extraction for Simple Classification	1525
<i>André Stuhlsatz, Jens Lippel, and Thomas Zielke</i>	

Towards a Generic Feature-Selection Measure for Intrusion Detection	1529
<i>Hai Thanh Nguyen, Katrin Franke, and Slobodan Petrovic</i>	

Discriminative Basis Selection Using Non-negative Matrix Factorization	1533
<i>Aruna Jammalamadaka, Swapna Joshi, S. Karthikeyan, and B.S. Manjunath</i>	
Recognizing Dance Motions with Segmental SVD	1537
<i>Liqun Deng, Howard Leung, Naijie Gu, and Yang Yang</i>	

Object Detection and Recognition III

Multi-class Graph Boosting with Subgraph Sharing for Object Recognition	1541
<i>Bang Zhang, Getian Ye, Yang Wang, Wei Wang, Jie Xu, Gunawan Herman, and Yun Yang</i>	
Level-Set Segmentation of Brain Tumors Using a New Hybrid Speed Function	1545
<i>Wanhyun Cho, Jonghyun Park, Soonyoung Park, Soohyung Kim, Sunworl Kim, Gukdong Ahn, Myungeun Lee, and Gueesang Lee</i>	
The Impact of Color on Bag-of-Words Based Object Recognition	1549
<i>David Augusto Rojas Vigo, Fahad Shahbaz Khan, Joost van de Weijer, and Theo Gevers</i>	
Pyramidal Model for Image Semantic Segmentation	1554
<i>Giuseppe Passino, Ioannis Patras, and Ebroul Izquierdo</i>	
Multi-view Based Estimation of Human Upper-Body Orientation	1558
<i>Lukas Rybok, Michael Voit, Hazim Kemal Ekenel, and Rainer Stiefelhagen</i>	

Structural Methods

An Iterative Algorithm for Approximate Median Graph Computation	1562
<i>Miquel Ferrer and Horst Bunke</i>	
A Supergraph-based Generative Model	1566
<i>Lin Han, Richard C. Wilson, and Edwin R. Hancock</i>	
Levelings and Flat Zone Morphology	1570
<i>Fernand Meyer</i>	
Combining Force Histogram and Discrete Lines to Extract Dashed Lines	1574
<i>Isabelle Debled-Rennesson and Laurent Wendling</i>	
Heat Flow-Thermodynamic Depth Complexity in Networks	1578
<i>Francisco Escolano, Miguel A. Lozano, and Edwin R. Hancock</i>	

Image Analysis V

Content Adaptive Hash Lookups for Near-Duplicate Image Search by Full or Partial Image Queries	1582
<i>Oztan Harmanci and Ismail Haritaoglu</i>	
The Good, the Bad, and the Ugly: Predicting Aesthetic Image Labels	1586
<i>Yaowen Wu, Christian Bauckhage, and Christian Thurau</i>	
Information Fusion for Combining Visual and Textual Image Retrieval	1590
<i>Xin Zhou, Adrien Depeursinge, and Henning Müller</i>	
Perceptual Image Retrieval by Adding Color Information to the Shape Context Descriptor	1594
<i>Marçal Rusiñol, Farshad Noorbakhsh, Dimosthenis Karatzas, Ernest Valveny, and Josep Lladós</i>	

Weighted Boundary Points for Shape Analysis	1598
<i>Jing Zhang and Rangachar Kasturi</i>	

Speech and Speaker Recognition

Dimension-Decoupled Gaussian Mixture Model for Short Utterance Speaker Recognition	1602
<i>Thilo Stadelmann and Bernd Freisleben</i>	
Modeling Syllable-Based Pronunciation Variation for Accented Mandarin Speech Recognition	1606
<i>Shilei Zhang, Qin Shi, and Yong Qin</i>	
Automatic Pronunciation Transliteration for Chinese-English Mixed Language Keyword Spotting	1610
<i>Shilei Zhang, Zhiwei Shuang, and Yong Qin</i>	
Learning Virtual HD Model for Bi-model Emotional Speaker Recognition	1614
<i>Ting Huang and Yingchun Yang</i>	
Role of Synthetically Generated Samples on Speech Recognition in a Resource-Scarce Language	1618
<i>Rupayan Chakraborty and Utpal Garain</i>	

Fingerprint

Detecting Altered Fingerprints	1622
<i>Jianjiang Feng, Anil K. Jain, and Arun Ross</i>	
A Variational Formulation for Fingerprint Orientation Modeling	1626
<i>Zujun Hou and Wei-Yun Yau</i>	
Fingerprint Pore Matching Based on Sparse Representation	1630
<i>Feng Liu, Qijun Zhao, Lei Zhang, and David Zhang</i>	
Latent Fingerprint Core Point Prediction Based on Gaussian Processes	1634
<i>Chang Su and Sargur Srihari</i>	
Towards a Better Understanding of the Performance of Latent Fingerprint Recognition in Realistic Forensic Conditions	1638
<i>Maria Puertas, Daniel Ramos, Julian Fierrez, Javier Ortega-Garcia, and Nicomedes Exposito</i>	

3D Shape Recovery; Image and Physics-Based Modeling; Motion and Multi-view Vision; Tracking and Surveillance

Online Next-Best-View Planning for Accuracy Optimization Using an Extended E-Criterion	1642
<i>Michael Trummer, Christoph Munkelt, and Joachim Denzler</i>	
Non Contact 3D Measurement Scheme for Transparent Objects Using UV Structured light	1646
<i>Rindra Rantson, Christophe Stolz, David Fofi, and Fabrice Mériaudeau</i>	

Extending Fast Marching Method under Point Light Source Illumination and Perspective Projection	1650
<i>Yuji Iwahori, Kazuki Iwai, Robert J. Woodham, Haruki Kawanaka, Shinji Fukui, and Kunio Kasugai</i>	
Effective Structure-from-Motion for Hybrid Camera Systems	1654
<i>Yalin Bastanlar, Alptekin Temizel, Yasemin Yardimci, and Peter Sturm</i>	
Single View Metrology Along Orthogonal Directions	1658
<i>Kun Peng, Lulu Hou, Ren Ren, Xianghua Ying, and Hongbin Zha</i>	
Depth Perception Model Based on Fixational Eye Movements Using Bayesian Statistical Inference	1662
<i>Norio Tagawa</i>	
One-Shot Scanning Using a Color Stripe Pattern	1666
<i>Renju Li and Hongbin Zha</i>	
Face Appearance Reconstruction Based on a Regional Statistical Craniofacial Model (RCSM)	1670
<i>Yan-fei Zhang, Ming-quan Zhou, Guo-hua Geng, and Jun Feng</i>	
3D Human Pose Reconstruction Using Millions of Exemplars	1674
<i>Hao Jiang</i>	
Recovering 3D Shape Using an Improved Fast Marching Method	1678
<i>Chengming Zou and Edwin Hancock</i>	
The Motion Dynamics Approach to the PnP Problem	1682
<i>Bo Wang and Fengmei Sun</i>	
Eigenbubbles: An Enhanced Apparent BRDF Representation	1686
<i>Ritwik Kumar, Baba C. Vemuri, and Arunava Banerjee</i>	
Reactive Object Tracking with a Single PTZ Camera	1690
<i>Murad Al Haj, Andrew D. Bagdanov, Jordi González, and F. Xavier Roca</i>	
An Experimental Study of Image Components and Data Metrics for Illumination-Robust Variational Optical Flow	1694
<i>Dmitry Chetverikov and József Molnár</i>	
Multiple Human Tracking Based on Multi-view Upper-Body Detection and Discriminative Learning	1698
<i>Junliang Xing, Haizhou Ai, and Shihong Lao</i>	
Visual Tracking Using Sparsity Induced Similarity	1702
<i>Huaping Liu and Fuchun Sun</i>	
An Information Fusion Approach for Multiview Feature Tracking	1706
<i>Esra Ataer Cansizoglu and Margrit Betke</i>	
Monocular 3D Tracking of Deformable Surfaces Using Linear Programming	1710
<i>Chenhao Wang, Xiong Li, and Yuncai Liu</i>	
Exploiting Visual Quasi-periodicity for Automated Chewing Event Detection Using Active Appearance Models and Support Vector Machines	1714
<i>Steven Cadavid and Mohamed Abdel-Mottaleb</i>	

Slip and Fall Events Detection by Analyzing the Integrated Spatiotemporal Energy Map	1718
<i>Tim Liao and Chung-Lin Huang</i>	
Color Constancy Using Standard Deviation of Color Channels	1722
<i>Anustup Choudhury and Gérard Medioni</i>	
Recognizing Human Actions Using Key Poses	1727
<i>Sermetcan Baysal, Mehmet Can Kurt, and Pinar Duygulu</i>	
Action Recognition Using Three-Way Cross-Correlations Feature of Local Motion Attributes	1731
<i>Tetsu Matsukawa and Takio Kurita</i>	
Discriminative Level Set for Contour Tracking	1735
<i>Wei Li, Xiaoqin Zhang, Jun Gao, Weiming Hu, Haibin Ling, and Xue Zhou</i>	
Tracking Objects with Adaptive Feature Patches for PTZ Camera Visual Surveillance	1739
<i>Yi Xie, Liang Lin, and Yunde Jia</i>	
Counting Moving People in Videos by Salient Points Detection	1743
<i>Donatello Conte, Pasquale Foggia, Gennaro Percannella, Francesco Tufano, and Mario Vento</i>	
Visualization of Customer Flow in an Office Complex over a Long Period	1747
<i>Masaki Onishi and Ikushi Yoda</i>	
Incremental MPCA for Color Object Tracking	1751
<i>Dong Wang, Huchuan Lu, and Yen-Wei Chen</i>	
Epipolar-Based Stereo Tracking Without Explicit 3D Reconstruction	1755
<i>Andre Gaschler, Darius Burschka, and Gregory Hager</i>	
Human Body Parts Tracking Using Sequential Markov Random Fields	1759
<i>Xiao-Qin Cao, Jia Zeng, and Zhi-Qiang Liu</i>	
Action Recognition in Videos Using Nonnegative Tensor Factorization	1763
<i>Barbara Krausz and Christian Bauckhage</i>	
Action Detection in Crowded Videos Using Masks	1767
<i>Ping Guo and Zhenjiang Miao</i>	
3D Model Based Vehicle Tracking Using Gradient Based Fitness Evaluation under Particle Filter Framework	1771
<i>Zhaoxiang Zhang, Kaiqi Huang, Tieniu Tan, and Yunhong Wang</i>	
Recovering 3D Shape and Light Source Positions from Non-planar Shadows	1775
<i>Yukihiro Yamashita, Fumihiko Sakaue, and Jun Sato</i>	
3D Contour Model Creation for Stereo-Vision Systems	1779
<i>Kenichi Maruyama, Yoshihiro Kawai, and Fumiaki Tomita</i>	
Multibody Motion Segmentation Using the Geometry of 6 Points in 2D Images	1783
<i>Klas Nordberg and Vasileios Zografos</i>	

Reflection Removal in Color Videos	1788
<i>Donatello Conte, Pasquale Foggia, Gennaro Percannella, Francesco Tufano, and Mario Vento</i>	
A Compound MRF Texture Model	1792
<i>Michal Haindl and Vojtech Havlicek</i>	
Shape Prototype Signatures for Action Recognition	1796
<i>Michael Donoser, Hayko Riemenschneider, and Horst Bischof</i>	
Shape Guided Maximally Stable Extremal Region (MSER) Tracking	1800
<i>Michael Donoser, Hayko Riemenschneider, and Horst Bischof</i>	
Locating People in Images by Optimal Cue Integration	1804
<i>Vicente Atienza-Vanacloig, Juan Rosell-Ortega, Gabriela Andreu-García, and Jose Miguel Valiente-González</i>	
Visual Tracking Algorithm Using Pixel-Pair Feature	1808
<i>Kenji Nishida, Takio Kurita, Yasuo Ogiuchi, and Masakatsu Higashikubo</i>	
Self-Calibration of Radially Symmetric Distortion by Model Selection	1812
<i>Jun Fujiki, Hideitsu Hino, Yumi Usami, Shotaro Akaho, and Noboru Murata</i>	
A Global Spatio-Temporal Representation for Action Recognition	1816
<i>Chao Deng, Xiaochun Cao, Hanyu Liu, and Jian Chen</i>	
Super-Resolution Texture Mapping from Multiple View Images	1820
<i>Masaaki Iiyama, Koh Kakusho, and Michihiko Minoh</i>	
Automatic Weak Calibration of Master-Slave Surveillance System Based on Mosaic Image	1824
<i>Li You, Song Li, and Wang Jia</i>	
Reconstruction-Free Parallel Planes Identification from Uncalibrated Images	1828
<i>Adlane Habed, Amir Amintabar, and Boubakeur Boufama</i>	
Accurate Dense Stereo by Constraining Local Consistency on Superpixels	1832
<i>Stefano Mattoccia</i>	
On-Line Structure and Motion Estimation Based on a Novel Parameterized Extended Kalman Filter	1836
<i>Sebastian Haner and Anders Heyden</i>	
Discriminant and Invariant Color Model for Tracking under Abrupt Illumination Changes	1840
<i>Jorge Scandaliaris and Alberto Sanfeliu</i>	
Using Local Affine Invariants to Improve Image Matching	1844
<i>Daniel Fleck and Zoran Duric</i>	
Segmenting Video Foreground Using a Multi-Class MRF	1848
<i>Patrick Dickinson, Andrew Hunter, and Kofi Appiah</i>	
Real-Time Pose Regression with Fast Volume Descriptor Computation	1852
<i>Michiro Hirai, Norimichi Ukita, and Masatsugu Kidode</i>	

Document Analysis (Poster Session)

Robust Staffline Thickness and Distance Estimation in Binary and Gray-Level Music Scores	1856
<i>Jaime S. Cardoso and Ana Rebelo</i>	
Hierarchical Decomposition of Handwriting Deformation Vector Field for Improving Recognition Accuracy	1860
<i>Toru Wakahara and Seiichi Uchida</i>	
Prototype-Based Methodology for the Statistical Analysis of Local Features in Stereotypical Handwriting Tasks	1864
<i>Christian O'Reilly and Réjean Plamondon</i>	
The Snippet Statistics of Font Recognition	1868
<i>Jakub Lidke, Christian Thureau, and Christian Bauckhage</i>	
A Study of Designing Compact Recognizers of Handwritten Chinese Characters Using Multiple-Prototype Based Classifiers	1872
<i>Yongqiang Wang and Qiang Huo</i>	
Membership Functions for Zoning-Based Recognition of Handwritten Digits	1876
<i>Sebastiano Impedovo, Raffaele Modugno, and Giuseppe Pirlo</i>	
Scribe Identification in Medieval English Manuscripts	1880
<i>Tara Gilliam, Richard C. Wilson, and John A. Clark</i>	
Recognition of Handwritten Arabic (Indian) Numerals Using Freeman's Chain Codes and Abductive Network Classifiers	1884
<i>Isah A. Lawal, Radwan E. Abdel-Aal, and Sabri A. Mahmoud</i>	
A SVM-HMM Based Online Classifier for Handwritten Chemical Symbols	1888
<i>Yang Zhang, Guangshun Shi, and Kai Wang</i>	
Symbol Recognition Combining Vectorial and Pixel-Level Features for Line Drawings	1892
<i>Feng Su, Tong Lu, and Ruoyu Yang</i>	
Writing Order Recovery from Off-Line Handwriting by Graph Traversal	1896
<i>Luigi P. Cordella, Claudio De Stefano, Angelo Marcelli, and Adolfo Santoro</i>	
Holistic Urdu Handwritten Word Recognition Using Support Vector Machine	1900
<i>Malik Waqas Sagheer, Chun Lei He, Nicola Nobile, and Ching Y. Suen</i>	
A Framework for the Combination of Different Arabic Handwritten Word Recognition Systems	1904
<i>Haikal El Abed and Volker Märgner</i>	
Degraded Character Recognition by Image Quality Evaluation	1908
<i>Chunmei Liu</i>	
Offline Arabic Handwriting Identification Using Language Diacritics	1912
<i>Mohammed Lutf, Xinge You, and Hong Li</i>	

Removing Rule-Lines from Binary Handwritten Arabic Document Images Using Directional Local Profile	1916
<i>Zhixin Shi, Srirangaraj Setlur, and Venu Govindaraju</i>	
A Bag-of-Pages Approach to Unordered Multi-page Document Classification	1920
<i>Albert Gordo and Florent Perronnin</i>	
Fast Seamless Skew and Orientation Detection in Document Images	1924
<i>Iuliu Vasile Konya, Stefan Eickeler, and Christoph Seibert</i>	
Unsupervised Block Covering Analysis for Text-Line Segmentation of Arabic Ancient Handwritten Document Images	1929
<i>Wafa Boussellaa, Abderrazak Zahour, Haikal Elabed, Abdellatif Benabdelhafid, and Adel M. Alimi</i>	
A Bi-modal Handwritten Text Corpus: Baseline Results	1933
<i>Moises Pastor, Alejandro Héctor Toselli, Francisco Casacuberta, and Enrique Vidal</i>	
Feature Selection Using Multiobjective Optimization for Named Entity Recognition	1937
<i>Asif Ekbal, Sriparna Saha, and Christoph S. Garbe</i>	
Redif Extraction in Handwritten Ottoman Literary Texts	1941
<i>Ethem Fatih Can, Pinar Duygulu, Fazli Can, and Mehmet Kalpakli</i>	
Analysis of Local Features for Handwritten Character Recognition	1945
<i>Seiichi Uchida and Marcus Liwicki</i>	
Detect Visual Spoofing in Unicode-Based Text	1949
<i>Bite Qiu, Ning Fang, and Liu Wenyin</i>	
Comparing Several Techniques for Offline Recognition of Printed Mathematical Symbols	1953
<i>Francisco Álvaro and Joan Andreu Sánchez</i>	
Symbol Classification Using Dynamic Aligned Shape Descriptor	1957
<i>Alicia Fornés, Sergio Escalera, Josep Lladós, and Ernest Valveny</i>	
Document Logo Detection and Recognition Using Bayesian Model	1961
<i>Hongye Wang</i>	
An Efficient Staff Removal Approach from Printed Musical Documents	1965
<i>Anjan Dutta, Umapada Pal, Alicia Fornés, and Josep Lladós</i>	
Combining Spectral and Spatial Features for Robust Foreground-Background Separation	1969
<i>Martin Lettner and Robert Sablatnig</i>	
Unsupervised Learning of Stroke Tagger for Online Kanji Handwriting Recognition	1973
<i>Mathieu Blondel, Kazuhiro Seki, and Kuniaki Uehara</i>	
A Baseline Dependent Approach for Persian Handwritten Character Segmentation	1977
<i>Alireza Alaei, P. Nagabhushan, and Umapada Pal</i>	

Bayesian Networks Learning Algorithms for Online Form Classification	1981
<i>Emilie Philippot, Yolande Belaïd, and Abdel Belaïd</i>	
Bangla and English City Name Recognition for Indian Postal Automation	1985
<i>Umapada Pal, Ramit Kumar Roy, and Fumitaka Kimura</i>	
Shape Code Based Word-Image Matching for Retrieval of Indian	
Multi-lingual Documents	1989
<i>Arundhati Tarafdar, Ranju Mondal, Srikanta Pal, Umapada Pal, and Fumitaka Kimura</i>	
Stochastic Segment Model Adaptation for Offline Handwriting Recognition	1993
<i>Rohit Prasad, Anurag Bhardwaj, Krishna Subramanian, Huaigu Cao, and Prem Natarajan</i>	
Shape-Based Image Retrieval Using a New Descriptor Based on the Radon	
and Wavelet Transforms	1997
<i>Nafaa Nacereddine, Salvatore Tabbone, Djemel Ziou, and Latifa Hamami</i>	
CUDA Implementation of Deformable Pattern Recognition and its Application	
to MNIST Handwritten Digit Database	2001
<i>Yoshiki Mizukami, Katsumi Tadamura, Jonathan Warrell, Peng Li, and Simon Prince</i>	
Text Independent Writer Identification for Bengali Script	2005
<i>Sukalpa Chanda, Katrin Franke, Umapada Pal, and Tetsushi Wakabayashi</i>	
Document Image Retrieval Using Feature Combination in Kernel Space	2009
<i>Ehtesham Hassan, Santanu Chaudhury, and M. Gopal</i>	
A Novel Handwritten Urdu Word Spotting Based on Connected Components	
Analysis	2013
<i>Malik Waqas Sagheer, Nicola Nobile, Chun Lei He, and Ching Y. Suen</i>	
Computer Assisted Transcription of Text Images: Results on the GERMANA	
Corpus and Analysis of Improvements Needed for Practical Use	2017
<i>Verónica Romero, Alejandro H. Toselli, and Enrique Vidal</i>	
OCR Post-processing Using Weighted Finite-State Transducers	2021
<i>Rafael Llobet, Jose-Ramon Cerdan-Navarro, Juan-Carlos Perez-Cortes, and Joaquim Arlandis</i>	
Top Down Analysis of Line Structure in Handwritten Documents	2025
<i>Harish Kasiviswanathan, Gregory R. Ball, and Sargur N. Srihari</i>	
Unsupervised Evaluation Methods Based on Local Gray-Intensity Variances	
for Binarization of Historical Documents	2029
<i>Marte A. Ramírez-Ortegón and Raúl Rojas</i>	
On the Significance of Stroke Size and Position for Online Handwritten	
Devanagari Word Recognition: An Empirical Study	2033
<i>A. Bharath and Sriganesh Madhvanath</i>	
Noise Tolerant Script Identification of Printed Oriental and English	
Documents Using a Downgraded Pixel Density Feature	2037
<i>Ning Wang, Louisa Lam, and Ching Y. Suen</i>	
Using Spatial Relations for Graphical Symbol Description	2041
<i>Santosh K.C., Laurent Wendling, and Bart Lamiroy</i>	

Automatic Discrimination between Confusing Classes with Writing Styles Verification in Arabic Handwritten Numeral Recognition	2045
<i>Chun Lei He, Louisa Lam, and Ching Y. Suen</i>	
Random Subspace Method in Text Categorization	2049
<i>Mehrdad J. Gangeh, Mohamed S. Kamel, and Robert P.W. Duin</i>	
Shape-DNA: Effective Character Restoration and Enhancement for Arabic Text Documents	2053
<i>Gulcin Caner and Ismail Haritaoglu</i>	
Incorporating Linguistic Model Adaptation into Whole-Book Recognition	2057
<i>Pingping Xiu and Henry S. Baird</i>	
Online Arabic Handwriting Modeling System Based on the Graphemes Segmentation	2061
<i>Houcine Boubaker, Abdelkarim El Baati, Monji Kherallah, Adel M. Alimi, and Haikel Elabed</i>	

Tracking and Surveillance II

The Fusion of Deep Learning Architectures and Particle Filtering Applied to Lip Tracking	2065
<i>Gustavo Carneiro and Jacinto C. Nascimento</i>	
Robust Head-Shoulder Detection by PCA-Based Multilevel HOG-LBP Detector for People Counting	2069
<i>Chengbin Zeng and Huadong Ma</i>	
Adaptive Motion Model for Human Tracking Using Particle Filter	2073
<i>Mohammad Hossein Ghaemini, Amir Hossein Shabani, and Shahryar Baradaran Shokouhi</i>	
Bayesian GOETHE Tracking	2077
<i>Sebastian Wirkert, Emmanuel Dellandréa, and Liming Chen</i>	
A Combined Self-Configuring Method for Object Tracking in Colour Video	2081
<i>Juan Rosell-Ortega, Gabriela García-Andreu, Ángel Rodas-Jordà, and Vicente Atienza-Vanacloig</i>	

Shape Modeling I

A Geometric Invariant Shape Descriptor Based on the Radon, Fourier, and Mellin Transforms	2085
<i>Thai V. Hoang and Salvatore Tabbone</i>	
Fundamental Geodesic Deformations in Spaces of Treelike Shapes	2089
<i>Aasa Feragen, François Lauze, and Mads Nielsen</i>	
Shape Interpolation with Flattenings	2094
<i>Fernand Meyer</i>	
Circularity Measuring in Linear Time	2098
<i>Thanh Phuong Nguyen and Isabelle Debled-Rennesson</i>	

Multiscale Analysis from 1D Parametric Geometric Decomposition of Shapes	2102
<i>Fabien Feschet</i>	

Image and Physics-Based Modeling

Region-Based Image Transform for Transition Between Object Appearances	2106
<i>Tomokazu Takahashi, Yuki Kono, Ichiro Ide, and Hiroshi Murase</i>	
Extended Multiple View Geometry for Lights and Cameras from Photometric and Geometric Constraints	2110
<i>Kazuki Kato, Fumihiko Sakaue, and Jun Sato</i>	
Near-Regular BTF Texture Model	2114
<i>Michal Haindl and Martin Hatka</i>	
Detecting Vorticity in Optical Flow of Fluids	2118
<i>Ashish Doshi and Adrian G. Bors</i>	
Modeling Facial Skin Motion Properties in Video and Its Application to Matching Faces across Expressions	2122
<i>Vasant Manohar, Matthew Shreve, Dmitry Goldgof, and Sudeep Sarkar</i>	

Kernel Methods

AdaMKL: A Novel Biconvex Multiple Kernel Learning Approach	2126
<i>Ziming Zhang, Ze-Nian Li, and Mark S. Drew</i>	
Von Mises-Fisher Mean Shift for Clustering on a Hypersphere	2130
<i>Takumi Kobayashi and Nobuyuki Otsu</i>	
Nonlinear Mappings for Generative Kernels on Latent Variable Models	2134
<i>Anna Carli, Manuele Bicego, Sisto Baldo, and Vittorio Murino</i>	
Multiple Kernel Learning with High Order Kernels	2138
<i>Shuhui Wang, Shuqiang Jiang, Qingming Huang, and Qi Tian</i>	
Kernel-Based Implicit Regularization of Structured Objects	2142
<i>Francois Xavier Dupé, Sébastien Bougleux, Luc Brun, Olivier Lézoray, and Abderahim Elmoataz</i>	

Face Analysis

Face Sketch Synthesis via Sparse Representation	2146
<i>Liang Chang, Mingquan Zhou, Yanjun Han, and Xiaoming Deng</i>	
Restoration of a Frontal Illuminated Face Image Based on KPCA	2150
<i>Xiaohua Xie, Wei-Shi Zheng, Jian-huang Lai, and Ching Y. Suen</i>	
A Bayesian Approach to Face Hallucination Using DLPP and KRR	2154
<i>Muhammad Tanveer and Naveed Iqbal</i>	
Face Hallucination under an Image Decomposition Perspective	2158
<i>Yan Liang, Jian-Huang Lai, Xiaohua Xie, and Wanquan Liu</i>	
Gender Classification Using Local Directional Pattern (LDP)	2162
<i>Taskeed Jabid, Md. Hasanul Kabir, and Oksam Chae</i>	

Document Analysis I

Generating Sets of Classifiers for the Evaluation of Multi-expert Systems	2166
<i>Donato Impedovo and Giuseppe Pirlo</i>	
Imbalance and Concentration in k-NN Classification	2170
<i>Dawei Yin, Chang An, and Henry S. Baird</i>	
Gaussian Mixture Models for Arabic Font Recognition	2174
<i>Fouad Slimane, Slim Kanoun, Adel M. Alimi, Rolf Ingold, and Jean Hennebert</i>	
Transfer of Supervision for Improved Address Standardization	2178
<i>Govind Kothari, Tanveer A. Faruque, L. Venkata Subramaniam, K. Hima Prasad, and Mukesh K. Mohania</i>	
Bag of Characters and SOM Clustering for Script Recognition and Writer Identification	2182
<i>Simone Marinai, Beatrice Miotti, and Giovanni Soda</i>	

Gait and Gesture

Multi-view Gait Recognition Based on Motion Regression Using Multilayer Perceptron	2186
<i>Worapan Kusakunniran, Qiang Wu, Jian Zhang, and Hongdong Li</i>	
Robust Gait Recognition Against Speed Variation	2190
<i>Muhammad Rasyid Aqmar, Koichi Shinoda, and Sadaoki Furui</i>	
Gait Recognition Using Period-Based Phase Synchronization for Low Frame-Rate Videos	2194
<i>Atsushi Mori, Yasushi Makihara, and Yasushi Yagi</i>	
Body Motion Analysis for Multi-modal Identity Verification	2198
<i>George Williams, Graham Taylor, Kirill Smolskiy, and Chris Bregler</i>	
Robust Sign Language Recognition with Hierarchical Conditional Random Fields	2202
<i>Hee-Deok Yang and Seong-Whan Lee</i>	

Image and Video Processing

Compressive Sampling Recovery for Natural Images	2206
<i>Fei Shang, Huiqian Du, and Yunde Jia</i>	
De-ghosting for Image Stitching with Automatic Content-Awareness	2210
<i>Yu Tang and Jungpil Shin</i>	
Content-Adaptive Automatic Image Sharpening	2214
<i>Tatsuya Kobayashi and Johji Tajima</i>	
Irradiance Preserving Image Interpolation	2218
<i>Andrea Giachetti</i>	
Interpolation and Sampling on a Honeycomb Lattice	2222
<i>Robin Strand</i>	

Optimization of Topological Active Models with Multiobjective Evolutionary Algorithms	2226
<i>J. Novo, J. Santos, M.G. Penedo, and A. Fernández</i>	
Fast Super-Resolution Using Weighted Median Filtering	2230
<i>Andrey V. Nasonov and Andrey S. Krylov</i>	
Geodesic Thin Plate Splines for Image Segmentation	2234
<i>Herve Lombaert and Farida Cheriet</i>	
Gestures and Lip Shape Integration for Cued Speech Recognition	2238
<i>Panikos Heracleous, Norihiro Hagita, and Denis Beutemps</i>	
IFLT Based Real-Time Framework for Image Matching	2242
<i>Pranam Janney and Glenn Geers</i>	
High-Order Circular Derivative Pattern for Image Representation and Recognition	2246
<i>Sanqiang Zhao, Yongsheng Gao, and Terry Caelli</i>	
Automatic Face Replacement in Video Based on 2D Morphable Model	2250
<i>Feng Min, Nong Sang, and Zhefu Wang</i>	
3D Deformable Surfaces with Locally Self-Adjusting Parameters - A Robust Method to Determine Cell Nucleus Shapes	2254
<i>Margret Keuper, Thorsten Schmidt, Jan Padeken, Patrick Heun, Klaus Palme, Hans Burkhardt, and Olaf Ronneberger</i>	
Decomposition of Dynamic Textures Using Morphological Component Analysis: A New Adaptative Strategy	2258
<i>Sloven Dubois, Renaud Péteri, and Michel Ménard</i>	
Anisotropic Contour Completion for Cell Microinjection Targeting	2262
<i>Gabriele Becattini, Leonardo S. Mattos, and Darwin G. Caldwell</i>	
Active Contours with Thresholding Value for Image Segmentation	2266
<i>Gang Chen, Haiying Zhang, Iron Chen, and Wen Yang</i>	
An Iterative Method for Superresolution of Optical Flow Derived by Energy Minimisation	2270
<i>Yoshihiko Mochizuki, Yusuke Kameda, Atsushi Imiya, Tomoya Sakai, and Takashi Imaizumi</i>	
Non-rigid Image Registration for Historical Manuscript Restoration	2274
<i>Jie Wang and Chew Lim Tan</i>	
An Effective Decentralized Nonparametric Quickest Detection Approach	2278
<i>Dayu Yang and Hairong Qi</i>	
On the Design of a Class of Odd-Length Biorthogonal Wavelet Filter Banks for Signal and Image Processing	2282
<i>Aryaz Baradarani, Pankajkumar Mendapara, and Q.M. Jonathan Wu</i>	
Implicit Feature-Based Alignment System for Radiotherapy	2286
<i>Ryoichi Yamakoshi, Kousuke Hirasawa, Haruhisa Okuda, Hiroshi Kage, Kazuhiko Sumi, Hidenobu Sakamoto, Yuri Ivanov, Toshihiro Yanou, Daisaku Suga, and Masao Murakami</i>	

3D Vertebrae Segmentation in CT Images with Random Noises	2290
<i>Melih S. Aslan, Asem Ali, Aly A. Farag, Ben Arnold, Dongqing Chen, and Ping Xiang</i>	
An Improved Method for Cirrhosis Detection Using Liver's Ultrasound Images	2294
<i>Yusuke Fujita, Yoshihiko Hamamoto, Makoto Segawa, Shuji Terai, and Isao Sakaida</i>	
A Dual Pass Video Stabilization System Using Iterative Motion Estimation and Adaptive Motion Smoothing	2298
<i>Pan Pan, Akihiro Minagawa, Jun Sun, Yoshinobu Hotta, and Satoshi Naoi</i>	
A Modified Particle Swarm Optimization Applied in Image Registration	2302
<i>M. Khalid Khan and Ingela Nyström</i>	
Image Segmentation Based on Adaptive Fuzzy-C-Means Clustering	2306
<i>Mohamed Walid Ayeche, Karim El Kalti, and Bechir El Ayebe</i>	
Multi-spectral Satellite Image Registration Using Scale-Restricted SURF	2310
<i>Mustafa Teke and Alptekin Temizel</i>	
Automatic Attribute Threshold Selection for Blood Vessel Enhancement	2314
<i>Fred. N. Kiwanuka and Michael H.F. Wilkinson</i>	
Initialisation-Free Active Contour Segmentation	2318
<i>Xianghua Xie and Majid Mirmehdi</i>	
On Clock Offset Estimation in Wireless Sensor Networks with Weibull Distributed Network Delays	2322
<i>Aitzaz Ahmad, Amina Noor, Erchin Serpedin, Hazem Nounou, and Mohamed Nounou</i>	
Parallel Algorithm of Two-Dimensional Discrete Cosine Transform Based on Special Data Representation	2326
<i>M.A. Chicheva</i>	
Parallel Scales for More Accurate Displacement Estimation in Phase-Based Image Registration	2329
<i>Daniel Forsberg, Mats Andersson, and Hans Knutsson</i>	
A Comprehensive Evaluation on Non-deterministic Motion Estimation	2333
<i>Changzhu Wu and Qing Wang</i>	
A Full-View Spherical Image Format	2337
<i>Shigang Li and Ying Hai</i>	
Shift-map Image Registration	2341
<i>Linus Svärm and Petter Strandmark</i>	
An Adaptive Method for Efficient Detection of Salient Visual Object from Color Images	2346
<i>M. Brezovan, D. Burdescu, E. Ganea, L. Stanescu, and C. Stoica</i>	
Robust Matching in an Uncertain World	2350
<i>Frédéric Sur</i>	
Recursive Dynamically Variable Step Search Motion Estimation Algorithm for High Definition Video	2354
<i>Ozgur Tasdizen and Ilker Hamzaoglu</i>	

Spatial and Temporal Enhancement of Depth Images Captured by a Time-of-Flight Depth Sensor	2358
<i>Sung-Yeol Kim, Ji-Ho Cho, Andreas Koschan, and Mongi A. Abidi</i>	
Transition Thresholds for Binarization of Historical Documents	2362
<i>Marte A. Ramírez-Ortegón and Raúl Rojas</i>	
Image Quality Metrics: PSNR vs. SSIM	2366
<i>Alain Horé and Djemel Ziou</i>	
Coarse Scale Feature Extraction Using the Spiral Architecture Structure	2370
<i>Sonya Coleman, Bryan Scotney, and Bryan Gardiner</i>	
Visual Perception Driven Registration of Mammograms	2374
<i>A. Boucher, F. Cloppet, N. Vincent, and P. Jouve</i>	
Robust Fourier-Based Image Alignment with Gradient Complex Image	2378
<i>Hong-Ren Su, Shang-Hong Lai, and Ya-Hui Tsai</i>	
Rate Control of H.264 Encoded Sequences by Dropping Frames in the Compressed Domain	2382
<i>Spyridon K. Kapotas and Athanassios N. Skodras</i>	
Statistical Analysis of Kalman Filters by Conversion to Gauss-Helmert Models with Applications to Process Noise Estimation	2386
<i>Arne Petersen and Reinhard Koch</i>	
Color Adjacency Modeling for Improved Image and Video Segmentation	2390
<i>Brian L. Price, Bryan S. Morse, and Scott Cohen</i>	
Paired Transform Slice Theorem of 2-D Image Reconstruction from Projections	2395
<i>Serkan Dursun, Nan Du, and Artyom M. Grigoryan</i>	
Segmentation of Cervical Cell Images	2399
<i>Asli Kale and Selim Aksoy</i>	
Principal Contour Extraction and Contour Classification to Detect Coronal Loops from the Solar Images	2403
<i>Nurcan Durak and Olfa Nasraoui</i>	
Human Shadow Removal with Unknown Light Source	2407
<i>Chia-Chih Chen and J.K. Aggarwal</i>	
Generalizing Tableau to Any Color of Teaching Boards	2411
<i>Daniel M. Oliveira and Rafael D. Lins</i>	
Enhancing the Filtering-Out of the Back-to-Front Interference in Color Documents with a Neural Classifier	2415
<i>G.F.P. e Silva, R.D. Lins, J.M. Silva, S. Banergee, A. Kuchibhotla, and M. Thielo</i>	
A Scale Estimation Algorithm Using Phase-Based Correspondence Matching for Electron Microscope Images	2420
<i>Ayako Suzuki, Koichi Ito, Takafumi Aoki, and Ruriko Tsuneta</i>	
Edge Drawing: A Heuristic Approach to Robust Real-Time Edge Detection	2424
<i>Cihan Topal, Cüneyt Akınlar, and Yakup Genç</i>	

MPEG-2 Video Watermarking Using Pattern Consideration	2428
<i>Azadeh Mansouri, Ahmad Mahmoudi Aznaveh, and Farah Torkamani-Azar</i>	
Lip Segmentation Using Level Set Method: Fusing Landmark Edge Distance and Image Information	2432
<i>Seyed Reza Banimahd and Hossein Ebrahimnezhad</i>	
Adaptive Color Independent Components Based SIFT Descriptors for Image Classification	2436
<i>Danni Ai, Xianhua Han, Xiang Ruan, and Yen-Wei Chen</i>	
Bioinformatics and Biomedical Applications	
Joint Registration and Segmentation of Histological Volume Data by Diffusion-Based Label Adaption	2440
<i>Felix Bollenbeck and Udo Seiffert</i>	
The Use of Genetic Programming for Learning 3D Craniofacial Shape Quantifications	2444
<i>Indriyati Atmosukarto, Linda G. Shapiro, and Carrie Heike</i>	
Identification of Ancestry Informative Markers from Chromosome-Wide Single Nucleotide Polymorphisms Using Symmetrical Uncertainty Ranking	2448
<i>Theera Piroonratana, Waranyu Wongseree, Touchpong Usavanarong, Anunchai Assawamakin, Chanin Limwongse, and Nachol Chaiyaratana</i>	
Evaluation of a New Point Clouds Registration Method Based on Group Averaging Features	2452
<i>Maja Temerinac-Ott, Margret Keuper, and Hans Burkhardt</i>	
Cell Tracking in Video Microscopy Using Bipartite Graph Matching	2456
<i>Ananda S. Chowdhury, Rohit Chatterjee, Mayukh Ghosh, and Nilanjan Ray</i>	
Human State Classification and Predication for Critical Care Monitoring by Real-Time Bio-signal Analysis	2460
<i>Xiaokun Li and Fatih Porikli</i>	
Automated Cephalometric Landmark Identification Using Shape and Local Appearance Models	2464
<i>Johannes Keustermans, Wouter Mollemans, Dirk Vandermeulen, and Paul Suetens</i>	
Color Analysis for Segmenting Digestive Organs in VCE	2468
<i>Hai Vu, Yasushi Yagi, Tomio Echigo, Masatsugu Shiba, Kazuhide Higuchi, Tetsuo Arakawa, and Keiko Yagi</i>	
A New Application of MEG and DTI on Word Recognition	2472
<i>Lu Meng, Jing Xiang, Dazhe Zhao, and Hong Zhao</i>	
A Hypothesis Testing Approach for Fluorescent Blob Identification	2476
<i>Le-Shin Wu and Sidney L. Shaw</i>	
Automated Detection of Nucleoplasmic Bridges for DNA Damage Scoring in Binucleated Cells	2480
<i>Changming Sun, Pascal Vallotton, Michael Fenech, and Philip Thomas</i>	

Multiple Model Estimation for the Detection of Curvilinear Segments in Medical X-ray Images Using Sparse-plus-dense-RANSAC	2484
<i>Chrysi Papalazarou, Peter M.J. Rongen, and Peter H.N. de With</i>	
Statistical Texture Modeling for Medical Volume Using Generalized N-Dimensional Principal Component Analysis Method and 3D Volume Morphing	2488
<i>Xu Qiao and Yen-Wei Chen</i>	
Distinguishing Patients with Gastritis and Cholecystitis from the Healthy by Analyzing Wrist Radial Arterial Doppler Blood Flow Signals	2492
<i>Xiaorui Jiang, Dongyu Zhang, Kuanquan Wang, and Wangmeng Zuo</i>	
Pelvic Organs Dynamic Feature Analysis for MRI Sequence Discrimination	2496
<i>Mehdi Rahim, Marc-Emmanuel Bellemare, Rémy Bulot, and Nicolas Pirró</i>	
Multiple Atlas Inference and Population Analysis Using Spectral Clustering	2500
<i>Giorgos Sfikas, Christian Heinrich, and Christophoros Nikou</i>	
Automatic Pathology Annotation on Medical Images: A Statistical Machine Translation Framework	2504
<i>Tianxia Gong, Shimiao Li, Chew Lim Tan, Boon Chuan Pang, C.C. Tchoyoson Lim, Cheng Kiang Lee, Qi Tian, and Zhuo Zhang</i>	
3D Cell Nuclei Fluorescence Quantification Using Sliding Band Filter	2508
<i>Pedro Quelhas, Ana Maria Mendonça, and Aurélio Campilho</i>	
AP-Based Consensus Clustering for Gene Expression Time Series	2512
<i>Tai-Yu Chiu, Ting-Chieh Hsu, and Jia-Shung Wang</i>	
Unsupervised Tissue Image Segmentation through Object-Oriented Texture	2516
<i>Akif Burak Tosun, Cenk Sokmensuer, and Cigdem Gunduz-Demir</i>	
Automated Tracking of Vesicles in Phase Contrast Microscopy Images	2520
<i>Peter Usenik, Tomaž Vrtovec, Franjo Pernuš, and Boštjan Likar</i>	
Automatic Detection and Segmentation of Focal Liver Lesions in Contrast Enhanced CT Images	2524
<i>Arne Militzer, Tobias Hager, Florian Jäger, Christian Tietjen, and Joachim Hornegger</i>	
Automatic Diagnosis of Masses by Using Level set Segmentation and Shape Description	2528
<i>Arnau Oliver, Albert Torrent, Xavier Lladó, and Joan Martí</i>	
3D Reconstruction of Tumors for Applications in Laparoscopy Using Conformal Geometric Algebra	2532
<i>R. Machucho-Cadena and E. Bayro-Corrochano</i>	
Vessel Bend-Based Cup Segmentation in Retinal Images	2536
<i>Gopal Datt Joshi, Jayanthi Sivaswamy, Kundun Karan, Prashanth R., and S.R. Krishnadas</i>	
A Spot Segmentation Approach for 2D Gel Electrophoresis Images Based on 2D Histograms	2540
<i>Eleni Zacharia, Eirini Kostopoulou, Dimitris Maroulis, and Sophia Kossida</i>	

Automated Tracking of the Carotid Artery in Ultrasound Image Sequences Using a Self Organizing Neural Network	2544
<i>Jimmy C. Azar and Hamed Hamid Muhammed</i>	
Quantification of Subcellular Molecules in Tissue Microarray	2548
<i>Ali Can, Musodiq O. Bello, and Michael J. Gerdes</i>	
Actual Midline Estimation from Brain CT Scan Using Multiple Regions Shape Matching	2552
<i>Wenan Chen, Kayvan Najarian, and Kevin Ward</i>	
Boosting Alzheimer Disease Diagnosis Using PET Images	2556
<i>Margarida Silveira and Jorge Marques</i>	
Efficient Quantitative Information Extraction from PCR-RFLP Gel Electrophoresis Images	2560
<i>Christos Maramis and Anastasios Delopoulos</i>	
Heart Murmur Classification Using Complexity Signatures	2564
<i>D. Kumar, P. Carvalho, R. Couceiro, M. Antunes, R.P. Paiva, and J. Henriques</i>	
3D Filtering for Injury Detection in Brain MRI	2568
<i>Yu Sun and Bir Bhanu</i>	
Prediction of Protein Sub-nuclear Location by Clustering mRMR Ensemble Feature Selection	2572
<i>Okan Sakar, Olcay Kursun, Huseyin Seker, and Fikret Gurgun</i>	
Multivariate Brain Mapping by Random Subspaces	2576
<i>Diego Sona and Paolo Avesani</i>	
Dual Channel Colocalization for Cell Cycle Analysis Using 3D Confocal Microscopy	2580
<i>Stefan Jaeger, Kannappan Palaniappan, Corella S. Casas-Delucchi, and M. Cristina Cardoso</i>	
Automated Cell Phase Classification for Zebrafish Fluorescence Microscope Images	2584
<i>Yanting Lu, Jianfeng Lu, Tianming Liu, and Jingyu Yang</i>	
Data-Driven Lung Nodule Models for Robust Nodule Detection in Chest CT	2588
<i>Amal A. Farag, James Graham, Salwa Elshazly, and Aly Farag</i>	
Segmentation of Anatomical Structures in Brain MR Images Using Atlases in FSL - A Quantitative Approach	2592
<i>Octavian Soldea, Ahmet Ekin, Diana F. Soldea, Devrim Unay, Müjdat Çetin, Ayül Erçil, Mustafa Gökhan Uzunbaş, Zeynep Firat, Mutlu Cihangiroglu, and The Alzheimers Disease Neuroimaging Initiative</i>	
Graphical Model-Based Tracking of Curvilinear Structures in Bio-image Sequences	2596
<i>Pradeep Koulgi, Mehmet Emre Sargin, Kenneth Rose, and B.S. Manjunath</i>	

Tracking and Surveillance III

Object Tracking by Structure Tensor Analysis	2600
<i>Michael Donoser, Stefan Kluckner, and Horst Bischof</i>	
Prototype Learning Using Metric Learning Based Behavior Recognition	2604
<i>Pengfei Zhu, Weiming Hu, Chunfeng Yuan, and Li Li</i>	
Are Correlation Filters Useful for Human Action Recognition?	2608
<i>Saad Ali and Simon Lucey</i>	
Tracking Hand Rotation and Grasping from an IR Camera Using Cylindrical Manifold Embedding	2612
<i>Chan-Su Lee and Shin Won Park</i>	
Particle Filter Tracking with Online Multiple Instance Learning	2616
<i>Zefeng Ni, Santhoshkumar Sunderrajan, Amir Rahimi, and B.S. Manjunath</i>	

Pattern Recognition Systems and Applications I

A Test of Granger Non-causality Based on Nonparametric Conditional Independence	2620
<i>Sohan Seth and José C. Principe</i>	
Haar Random Forest Features and SVM Spatial Matching Kernel for Stonefly Species Identification	2624
<i>N. Larios, B. Soran, L.G. Shapiro, G. Martínez-Muñoz, J. Lin, and T.G. Dietterich</i>	
Incorporating Lane Estimation as Context Source in Pedestrian Recognition Task	2628
<i>Magdalena Szczot, Iris Dannenmann, and Otto Löhlein</i>	
PILL-ID: Matching and Retrieval of Drug Pill Imprint Images	2632
<i>Young-Beom Lee, Unsang Park, and Anil K. Jain</i>	
Identifying Gender from Unaligned Facial Images by Set Classification	2636
<i>Wen-Sheng Chu, Chun-Rong Huang, and Chu-Song Chen</i>	

Shape Modeling II

Detection of Shapes in 2D Point Clouds Generated from Images	2640
<i>Jingyong Su, Zhiqiang Zhu, Anuj Srivastava, and Fred Huffer</i>	
Gait Learning-Based Regenerative Model: A Level Set Approach	2644
<i>Muayed S. Al-Huseiny, Sasan Mahmoodi, and Mark S. Nixon</i>	
Scale-Space Spectral Representation of Shape	2648
<i>Jonathan Bates, Xiuwen Liu, and Washington Mio</i>	
Learning Metrics for Shape Classification and Discrimination	2652
<i>Yu Fan, David Houle, and Washington Mio</i>	
Non-parametric 3D Shape Warping	2656
<i>Ulrich Hillenbrand</i>	

Image Denoising

Edge Preserving Image Denoising in Reproducing Kernel Hilbert Spaces	2660
<i>Pantelis Bouboulis, Sergios Theodoridis, and Konstantinos Slavakis</i>	
Multichannel Image Regularisation Using Anisotropic Geodesic Filtering	2664
<i>Jacopo Grazzini, Scott Dillard, and Pierre Soille</i>	
Local Jet Based Similarity for NL-Means Filtering	2668
<i>Antoine Manzanera</i>	
Image Denoising Based on Fuzzy and Intra-scale Dependency in Wavelet Transform Domain	2672
<i>Jamal Saeedi, Mohammad Hassan Moradi, and Ali Abedi</i>	
Noise-Insensitive Contrast Enhancement for Rendering High-Dynamic-Range Images	2676
<i>Hsueh-Yi Sean Lin</i>	

Feature Extraction for Face Recognition

Monogenic Binary Pattern (MBP): A Novel Feature Extraction and Representation Model for Face Recognition	2680
<i>Meng Yang, Lei Zhang, Lin Zhang, and David Zhang</i>	
Automatic Frequency Band Selection for Illumination Robust Face Recognition	2684
<i>Hazım Kemal Ekenel and Rainer Stiefelhagen</i>	
Directed Random Subspace Method for Face Recognition	2688
<i>Mehrtash T. Harandi, Majid Nili Ahmadi, Babak N. Araabi, Abbas Bigdeli, and Brian C. Lovell</i>	
Raw vs. Processed: How to Use the Raw and Processed Images for Robust Face Recognition under Varying Illumination	2692
<i>Li Xu, Lei Huang, and Changping Liu</i>	
Discriminative Prototype Learning in Open Set Face Recognition	2696
<i>Zhongkai Han, Chi Fang, and Xiaoqing Ding</i>	

Document Analysis II

On-Line Handwriting Word Recognition Using a Bi-character Model	2700
<i>Sophea Prum, Muriel Visani, and Jean-Marc Ogier</i>	
Ruling Line Removal in Handwritten Page Images	2704
<i>Daniel Lopresti and Ergina Kavallieratou</i>	
Script Identification – A Han and Roman Script Perspective	2708
<i>Sukalpa Chanda, Umapada Pal, Katrin Franke, and Fumitaka Kimura</i>	
Robust 1D Barcode Recognition on Mobile Devices	2712
<i>Johann C. Rocholl, Sebastian Klenk, and Gunther Heidemann</i>	
Fast Logo Detection and Recognition in Document Images	2716
<i>Zhe Li, Matthias Schulte-Austum, and Martin Neschen</i>	

Classification in Biomedicine

Joint Independent Component Analysis of Brain Perfusion and Structural Magnetic Resonance Images in Dementia	2720
<i>Duygu Tosun, Michael W. Weiner, Norbert Schuff, Howard Rosen, and Bruce L. Miller</i>	
Endoscopic Image Classification Using Edge-Based Features	2724
<i>M. Häfner, A. Gangl, M. Liedlgruber, A. Uhl, A. Vécsei, and F. Wrba</i>	
Biclustering of Expression Microarray Data with Topic Models	2728
<i>Manuele Bicego, Pietro Lovato, Alberto Ferrarini, and Massimo Delledonne</i>	
A Multiple Instance Learning Approach toward Optimal Classification of Pathology Slides	2732
<i>M. Murat Dundar, Sunil Badve, Vikas C. Raykar, Rohit K. Jain, Olcay Sertel, and Metin N. Gurcan</i>	
Gaussian ERP Kernel Classifier for Pulse Waveforms Classification	2736
<i>Dongyu Zhang, Wangmeng Zuo, David Zhang, Yanlai Li, and Naimin Li</i>	

Tracking and Surveillance IV

Human 3D Motion Recognition Based on Spatial-Temporal Context of Joints	2740
<i>Qiong Zhao, Lihua Wang, Horace H.S. Ip, and Xuehai Zhou</i>	
Matching Groups of People by Covariance Descriptor	2744
<i>Yinghao Cai, Valtteri Takala, and Matti Pietikäinen</i>	
Boosting Incremental Semi-supervised Discriminant Analysis for Tracking	2748
<i>Heng Wang, Xinwen Hou, and Cheng-Lin Liu</i>	
Optical Rails: View-Based Track Following with Hemispherical Environment Model and Orientation View Descriptors	2752
<i>David Dederscheck, Martin Zahn, Holger Friedrich, and Rudolf Mester</i>	
Forward-Backward Error: Automatic Detection of Tracking Failures	2756
<i>Zdenek Kalal, Krystian Mikolajczyk, and Jiri Matas</i>	

Pattern Recognition Systems and Applications II

Scene-Adaptive Human Detection with Incremental Active Learning	2760
<i>Ajay J. Joshi and Fatih Porikli</i>	
Direct Printability Prediction in VLSI Using Features from Orthogonal Transforms	2764
<i>Krzysztof Kryszczuk, Paul Hurley, and Robert Sayah</i>	
Improving Performance of Network Traffic Classification Systems by Cleaning Training Data	2768
<i>Francesco Gargiulo and Carlo Sansone</i>	
Bayesian Networks for Predicting IVF Blastocyst Development	2772
<i>Asli Uyar, Ayse Bener, H. Nadir Ciray, and Mustafa Bahceci</i>	
Spectral Invariant Representation for Spectral Reflectance Image	2776
<i>Abdelhameed Ibrahim, Shoji Tominaga, and Takahiko Horiuchi</i>	

Active Contours and Related Methods

Level Set Based Segmentation Using Local Feature Distribution	2780
<i>Xianghua Xie</i>	
Mean Shift Gradient Vector Flow: A Robust External Force Field for 3D	
Active Surfaces	2784
<i>Margret Keuper, Hans Burkhardt, Olaf Ronneberger, Jan Padeken, and Patrick Heun</i>	
Adaptive Diffusion Flow for Parametric Active Contours	2788
<i>Yuwei Wu, Yunde Jia, and Yuanquan Wang</i>	
Using Snakes with Asymmetric Energy Terms for the Detection	
of Varying-Contrast Edges in SAR Images	2792
<i>Benjamin Seppke, Leonie Dreschler-Fischer, and Nathanael Hübbe</i>	
Length Increasing Active Contour for the Segmentation of Small Blood	
Vessels	2796
<i>D. Rivest-Hénault, M. Cheriet, S. Deschênes, and C. Lapierre</i>	

Graphical Models and Bayesian Methods

Using Sequential Context for Image Analysis	2800
<i>António R.C. Paiva, Elizabeth Jurrus, and Tolga Tasdizen</i>	
Recovery Video Stabilization Using MRF-MAP Optimization	2804
<i>Soo Wan Kim, Kwang Moo Yi, Songhwai Oh, and Jin Young Choi</i>	
Annealed SMC Samplers for Dirichlet Process Mixture Models	2808
<i>Yener Ulker, Bilge Günsel, and Ali Taylan Cemgil</i>	
Bayesian Inference for Nonnegative Matrix Factor Deconvolution Models	2812
<i>Serap Kurbiz, A. Taylan Cemgil, and Bilge Günsel</i>	
A Graph Matching Algorithm Using Data-Driven Markov Chain Monte Carlo	
Sampling	2816
<i>Jungmin Lee, Minsu Cho, and Kyoung Mu Lee</i>	

Image Processing Applications

Tensor-Driven Hyperspectral Denoising: A Strong Link for Classification	
Chains?	2820
<i>Julio Martín-Herrero and Marcos Ferreira-Armán</i>	
Search Strategies for Image Multi-distortion Estimation	2824
<i>André-Louis Caron, Pierre-Marc Jodoin, and Christophe Charrier</i>	
Development of a High-Definition and Multispectral Image Capturing System	
for Digital Archiving of Early Modern Tapestries of Kyoto Gion Festival	2828
<i>Masaru Tsuchida, Keiji Yano, and Hiromi T. Tanaka</i>	
Appearance Control Using Projection with Model Predictive Control	2832
<i>Toshiyuki Amano and Hirokazu Kato</i>	
Decision Trees for Fast Thinning Algorithms	2836
<i>Costantino Grana, Daniele Borghesani, and Rita Cucchiara</i>	

Iris

Personal Identification from Iris Images Using Localized Radon Transform	2840
<i>Yingbo Zhou and Ajay Kumar</i>	
Segmentation of Unideal Iris Images Using Game Theory	2844
<i>Kaushik Roy, Ching Y. Suen, and Prabir Bhattacharya</i>	
Iris-Biometric Hash Generation for Biometric Database Indexing	2848
<i>Christian Rathgeb and Andreas Uhl</i>	
A Robust Iris Localization Method Using an Active Contour Model and Hough Transform	2852
<i>Jaehan Koh, Venu Govindaraju, and Vipin Chaudhary</i>	
IS_IS: Iris Segmentation for Identification Systems	2857
<i>Maria De Marsico, Michele Nappi, and Riccio Daniel</i>	

Handwriting Recognition

Consensus Network Based Hypotheses Combination for Arabic Offline Handwriting Recognition	2861
<i>Rohit Prasad, Matin Kamali, David Belanger, Antti-Veikko Rosti, Spyros Matsoukas, and Prem Natarajan</i>	
A Novel Lexicon Reduction Method for Arabic Handwriting Recognition	2865
<i>Safwan Wshah, Venu Govindaraju, Yanfen Cheng, and Huiping Li</i>	
A Novel Verification System for Handwritten Words Recognition	2869
<i>Laurent Guichard, Alejandro H. Toselli, and Bertrand Coïasnon</i>	
Multi-template GAT/PAT Correlation for Character Recognition with a Limited Quantity of Data	2873
<i>Toru Wakahara and Yukihiro Yamashita</i>	
Structure Adaptation of HMM Applied to OCR	2877
<i>Kamel Ait Mohand, Thierry Paquet, Nicolas Ragot, and Laurent Heutte</i>	

SVM, NN, Kernel and Learning; Object Detection and Recognition

Multi-class Pattern Classification in Imbalanced Data	2881
<i>Amal S. Ghanem, Svetha Venkatesh, and Geoff West</i>	
Deep Quantum Networks for Classification	2885
<i>Shusen Zhou, Qingcai Chen, and Xiaolong Wang</i>	
Nonlinear Combination of Multiple Kernels for Support Vector Machines	2889
<i>Jinbo Li and Shiliang Sun</i>	
Data Transformation of the Histogram Feature in Object Detection	2893
<i>Rongguo Zhang, Baihua Xiao, and Chunheng Wang</i>	
A New Learning Formulation for Kernel Classifier Design	2897
<i>Atsushi Sato</i>	
Variable Selection for Five-Minute Ahead Electricity Load Forecasting	2901
<i>Irena Koprinska, Rohen Sood, and Vassilios Agelidis</i>	

Enhancing Web Page Classification via Local Co-training	2905
<i>Youtian Du, Xiaohong Guan, and Zhongmin Cai</i>	
Robust Face Recognition Using Multiple Self-Organized Gabor Features and Local Similarity Matching	2909
<i>Saleh Aly, Atsushi Shimada, Naoyuki Tsuruta, and Rin-ichiro Taniguchi</i>	
Exploring Pattern Selection Strategies for Fast Neural Network Training	2913
<i>Szilárd Vajda and Gernot A. Fink</i>	
The Detection of Concept Frames Using Clustering Multi-instance Learning	2917
<i>D.M.J. Tax, E. Hendriks, M.F. Valstar, and M. Pantic</i>	
Kernel Domain Description with Incomplete Data: Using Instance-Specific Margins to Avoid Imputation	2921
<i>Adam Gripton and Weiping Lu</i>	
Learning a Strategy with Neural Approximated Temporal-Difference Methods in English Draughts	2925
<i>Stefan Faußer and Friedhelm Schwenker</i>	
Learning the Kernel Combination for Object Categorization	2929
<i>Deyuan Zhang, Xiaolong Wang, and Bingquan Liu</i>	
SemiCCA: Efficient Semi-supervised Learning of Canonical Correlations	2933
<i>Akisato Kimura, Hirokazu Kameoka, Masashi Sugiyama, Takuho Nakano, Eisaku Maeda, Hitoshi Sakano, and Katsuhiko Ishiguro</i>	
Spatial String Matching for Image Classification	2937
<i>Yunqiang Liu and Vicent Caselles</i>	
A Semi-supervised Gaussian Mixture Model for Image Segmentation	2941
<i>Adolfo Martínez-Usó, Filiberto Pla, and José M. Sotoca</i>	
Adding Classes Online in Error Correcting Output Codes Framework	2945
<i>Sergio Escalera, David Masip, Eloi Puertas, Petia Radeva, and Oriol Pujol</i>	
Pyramidal Multi-level Features for the Robot Vision@ICPR 2010 Challenge	2949
<i>Sébastien Paris and Hervé Glotin</i>	
Subclass Error Correcting Output Codes Using Fisher's Linear Discriminant Ratio	2953
<i>Nikolaos Arvanitopoulos, Dimitrios Bouzas, and Anastasios Tefas</i>	
Pattern Recognition Method Using Ensembles of Regularities Found by Optimal Partitioning	2957
<i>Oleg V. Senko and Anna V. Kuznetsova</i>	
A Geometric Radial Basis Function Network for Robot Perception and Action	2961
<i>E. Vázquez-Santacruz and E. Bayro-Corrochano</i>	
Kernel on Graphs Based on Dictionary of Paths for Image Retrieval	2965
<i>Jean-Emmanuel Haugeard, Sylvie Philipp-Foliguet, and Philippe-Henri Gosselin</i>	
An Efficient Active Constraint Selection Algorithm for Clustering	2969
<i>Viet-Vu Vu, Nicolas Labroche, and Bernadette Bouchon-Meunier</i>	

Fuzzy Support Vector Machines for ECG Arrhythmia Detection	2973
<i>N. Özlem Özcan and Fikret Gürçen</i>	
ROC Analysis and Cost-Sensitive Optimization for Hierarchical Classifiers	2977
<i>Pavel Paclík, Carmen Lai, Thomas C.W. Landgrebe, and Robert P.W. Duin</i>	
Variational Mixture of Experts for Classification with Applications to Landmine Detection	2981
<i>Seniha Esen Yuksel and Paul Gader</i>	
A Unifying Framework for Learning the Linear Combiners for Classifier Ensembles	2985
<i>Hakan Erdogan and Mehmet Umut Sen</i>	
Reinforcement Learning for Robust and Efficient Real-World Tracking	2989
<i>Andre Cohen and Vladimir Pavlovic</i>	
An Efficient and Stable Algorithm for Learning Rotations	2993
<i>Raman Arora and William A. Sethares</i>	
An Incremental Learning Algorithm for Non-stationary Environments and Class Imbalance	2997
<i>Gregory Ditzler, Robi Polikar, and Nitesh Chawla</i>	
Feature-Based Partially Occluded Object Recognition	3001
<i>Na Fan</i>	
A Sample Pre-mapping Method Enhancing Boosting for Object Detection	3005
<i>Haoyu Ren, Xiaopeng Hong, Cher-Keng Heng, Luhong Liang, and Xilin Chen</i>	
Context Inspired Pedestrian Detection in Far-Field Videos	3009
<i>Wenhua Ma, Peng He, Lei Huang, and Changping Liu</i>	
Theme-Based Multi-class Object Recognition and Segmentation	3013
<i>Shilin Wu, Jiajia Geng, and Feng Zhu</i>	
Boosted Sigma Set for Pedestrian Detection	3017
<i>Xiaopeng Hong, Hong Chang, Xilin Chen, and Wen Gao</i>	
Reverse Indexing for Reading Graffiti Tags	3021
<i>Christian Thureau and Christian Bauckhage</i>	
Generic Object Recognition by Tree Conditional Random Field Based on Hierarchical Segmentation	3025
<i>Takeshi Okumura, Tetsuya Takiguchi, and Yasuo Ariki</i>	
A Fast Approach for Pixelwise Labeling of Facade Images	3029
<i>Björn Fröhlich, Erik Rodner, and Joachim Denzler</i>	
Real-Time Traffic Sign Detection: An Evaluation Study	3033
<i>Ying Li, Sharath Pankanti, and Weiguang Guan</i>	
Image Categorization by Learned Nonlinear Subspace of Combined Visual-Words and Low-Level Features	3037
<i>Xian-Hua han, Yen-Wei Chen, and Xiang Ruan</i>	
Can Motion Segmentation Improve Patch-Based Object Recognition?	3041
<i>Adrian Ulges and Thomas M. Breuel</i>	

Semi-supervised and Interactive Semantic Concept Learning for Scene Recognition	3045
<i>Xian-Hua Han, Yen-Wei Chen, and Xiang Ruan</i>	
Dense Structure Inference for Object Classification in Aerial LIDAR Dataset	3049
<i>Eunyoung Kim and Gérard Medioni</i>	
Data-Driven Foreground Object Detection from a Non-stationary Camera	3053
<i>Shih-Wei Sun, Fay Huang, and Hong-Yuan Mark Liao</i>	
Efficient Shape Retrieval Under Partial Matching	3057
<i>M. Fatih Demirci</i>	
Component Identification in the 3D Model of a Building	3061
<i>Mai Xu, Maria Petrou, and Mohammad Jahangiri</i>	
Multi-scale Color Local Binary Patterns for Visual Object Classes Recognition	3065
<i>Chao Zhu, Charles-Edmond Bichot, and Liming Chen</i>	
Object Localization by Propagating Connectivity via Superfeatures	3069
<i>Ishani Chakraborty and Ahmed Elgammal</i>	
Efficient Object Detection and Matching Using Feature Classification	3073
<i>Fadi Dornaika and Fadi Chakik</i>	
A Discriminative Model for Object Representation and Detection via Sparse Features	3077
<i>Xi Song, Ping Luo, Liang Lin, and Yunde Jia</i>	
A Robust Recognition Technique for Dense Checkerboard Patterns	3081
<i>Vinh Ninh Dao and Masanori Sugimoto</i>	
Spike-Based Convolutional Network for Real-Time Processing	3085
<i>José-Antonio Pérez-Carrasco, Carmen Serrano, Begoña Acha, Teresa Serrano-Gotarredona, and Bernabé Linares-Barranco</i>	
Learning Affordances for Categorizing Objects and Their Properties	3089
<i>Nilgün Dag, İlkey Atıl, Sinan Kalkan, and Erol Şahin</i>	
Feature Pairs Connected by Lines for Object Recognition	3093
<i>Muhammad Awais and Krystian Mikolajczyk</i>	
Using Gait Features for Improving Walking People Detection	3097
<i>I. Bouchrika, J.N. Carter, M.S. Nixon, R. Mörzinger, and G. Thallinger</i>	
Learning-Based Vehicle Detection Using Up-Scaling Schemes and Predictive Frame Pipeline Structures	3101
<i>Yi-Min Tsai, Keng-Yen Huang, Chih-Chung Tsai, and Liang-Gee Chen</i>	
Dynamic Hand Pose Recognition Using Depth Data	3105
<i>Poonam Suryanarayan, Anbumani Subramanian, and Dinesh Mandalapu</i>	
A Hierarchical GIST Model Embedding Multiple Biological Feasibilities for Scene Classification	3109
<i>Yina Han and Guizhong Liu</i>	
Road Network Extraction Using Edge Detection and Spatial Voting	3113
<i>Beril Sırmaçek and Cem Ünsalan</i>	

Decomposition Methods and Learning Approaches for Imbalanced Dataset: An Experimental Integration	3117
<i>Paolo Soda and Giulio Iannello</i>	
The Balanced Accuracy and Its Posterior Distribution	3121
<i>Kay Henning Brodersen, Cheng Soon Ong, Klaas Enno Stephan, and Joachim M. Buhmann</i>	
Multimedia Analysis and Retrieval	
A Study on Detecting Patterns in Twitter Intra-topic User and Message Clustering	3125
<i>Marc Cheong and Vincent Lee</i>	
Classification of Near-Duplicate Video Segments Based on Their Appearance Patterns	3129
<i>Ichiro Ide, Yuji Shamoto, Daisuke Deguchi, Tomokazu Takahashi, and Hiroshi Murase</i>	
Motion Vector Based Features for Content Based Video Copy Detection	3134
<i>Kasım Taşdemir and A. Enis Çetin</i>	
A Statistical Learning Approach to Spatial Context Exploitation for Semantic Image Analysis	3138
<i>Georgios Th. Papadopoulos, Vasileios Mezaris, Ioannis Kompatsiaris, and Michael G. Strintzis</i>	
Wavelet-Based Texture Retrieval Using a Mixture of Generalized Gaussian Distributions	3143
<i>Mohand Saïd Allili</i>	
3D-Shape Retrieval Using Curves and HMM	3147
<i>Hedi Tabia, Olivier Colot, Mohamed Daoudi, and Jean-Philippe Vandeborre</i>	
Fast Fingerprint Retrieval with Line Detection	3151
<i>Hui-Cheng Lian</i>	
A High-Dimensional Access Method for Approximated Similarity Search in Text Mining	3155
<i>F. Artigas-Fuentes, R. Gil-García, and J.M. Badía-Contelles</i>	
3D Model Comparison through Kernel Density Matching	3159
<i>Yiming Wang, Tong Lu, Rongjun Gao, and Wenyin Liu</i>	
Improving the Efficiency of Content-Based Multimedia Exploration	3163
<i>Christian Beecks, Sascha Wiedenfeld, and Thomas Seidl</i>	
Tertiary Hash Tree: Indexing Structure for Content-Based Image Retrieval	3167
<i>Yoon-Sik Tak and Eenjun Hwang</i>	
An Augmented Reality Setup with an Omnidirectional Camera Based on Multiple Object Detection	3171
<i>Tomoki Hayashi, Hideaki Uchiyama, Julien Pilet, and Hideo Saito</i>	
Enhancing SVM Active Learning for Image Retrieval Using Semi-supervised Bias-Ensemble	3175
<i>Jun Wu, Ming-Yu Lu, and Chun-Li Wang</i>	

Interactive Browsing of Remote JPEF 2000 Image Sequences	3179
<i>Juan Pablo García-Ortiz, Vicente González-Ruiz, Inmaculada García, Daniel Müller, and George Dimitoglou</i>	
Binarization of Color Characters in Scene Images Using k-means Clustering and Support Vector Machines	3183
<i>Kohei Kita and Toru Wakahara</i>	
A Self-Training Learning Document Binarization Framework	3187
<i>Su Bolan, Lu Shijian, and Chew Lim Tan</i>	
Novel Edge Features for Text Frame Classification in Video	3191
<i>Palaiahnakote Shivakumara and Chew Lim Tan</i>	
Image Matching and Retrieval by Repetitive Patterns	3195
<i>Petr Dousek, Jiri Matas, Michal Perdoch, and Ondrej Chum</i>	
An Approach for Recognizing Text Labels in Raster Maps	3199
<i>Yao-Yi Chiang, Craig A. Knoblock</i>	
Detecting Screen Shot Images within Large-Scale Video Archive	3203
<i>Sebastien Poullot and Shin'Ichi Satoh</i>	
Suggesting Songs for Media Creation Using Semantics	3208
<i>Dhiraj Joshi, Mark. D. Wood, and Jiebo Luo</i>	
Color Feature Based Approach for Determining Ink Age in Printed Documents	3212
<i>Biswajit Halder and Utpal Garain</i>	
Automatic Detection and Localization of Natural Scene Text in Video	3216
<i>Xiaodong Huang and Huadong Ma</i>	
High-Level Feature Extraction Using SIFT GMMs and Audio Models	3220
<i>Nakamasa Inoue, Tatsuhiko Saito, Koichi Shinoda, and Sadaoki Furui</i>	
Pairwise Features for Human Action Recognition	3224
<i>Anh-Phuong Ta, Christian Wolf, Guillaume Lavoué, Atilla Baskurt, and Jean-Michel Jolion</i>	
Group Activity Recognition by Gaussian Processes Estimation	3228
<i>Zhongwei Cheng, Lei Qin, Qingming Huang, Shuqiang Jiang, and Qi Tian</i>	
Extracting Captions in Complex Background from Videos	3232
<i>Xiaoqian Liu, Weiqiang Wang, and Tingshao Zhu</i>	
Keyframe-Guided Automatic Non-linear Video Editing	3236
<i>Vaishnavi Rajgopalan, Ananth Ranganathan, Ramgopal Rajagopalan, and Sudhir P. Mudur</i>	
Images in News	3240
<i>Jagan Sankaranarayanan and Hanan Samet</i>	
A Multimodal Approach to Violence Detection in Video Sharing Sites	3244
<i>Theodoros Giannakopoulos, Aggelos Pikrakis, and Sergios Theodoridis</i>	
Video Retrieval Based on Tracked Features Quantization	3248
<i>Hiroaki Kubo, Julien Pilet, Hideo Saitoh, and Shin'ichi Satoh</i>	
Interactive Web Video Advertising with Context Analysis and Search	3252
<i>Bo Wang, Jinqiao Wang, Ling-Yu Duan, Qi Tian, Hanqing Lu, and Wen Gao</i>	

Selection of Photos for Album Building Applications	3256
<i>Egorova Marta Alexandrovna and Ilia Vladimirovich Safonov</i>	
Comparison of Multidimensional Data Access Methods for Feature-Based Image Retrieval	3260
<i>Serdar Arslan, Ahmet Saçan, Esra Açar, İ. Hakkı Toroslu, and Adnan Yazıcı</i>	
A Pixel-Based Evaluation Method for Text Detection in Color Images	3264
<i>Marios Anthimopoulos, Nikolaos Vlissidis, and Basilis Gatos</i>	
Active Boosting for Interactive Object Retrieval	3268
<i>Alexis Lechervy, Philippe-Henri Gosselin, and Frédéric Precioso</i>	
Geotagged Photo Recognition Using Corresponding Aerial Photos with Multiple Kernel Learning	3272
<i>Keita Yaegashi and Keiji Yanai</i>	
Efficient Semantic Indexing for Image Retrieval	3276
<i>Chandrika Pulla, Suman Karthik, and C.V. Jawahar</i>	
Improving and Aligning Speech with Presentation Slides	3280
<i>Ranjini Swaminathan, Michael E. Thompson, Sandiway Fong, Alon Efrat, Arnon Amir, and Kobus Barnard</i>	
The ImageCLEF Medical Retrieval Task at ICPR 2010 – Information Fusion	3284
<i>Henning Müller and Jayashree Kalpathy-Cramer</i>	
Unified Approach to Detection and Identification of Commercial Films by Temporal Occurrence Pattern	3288
<i>Narongsak Putpuek, Nagul Cooharajanane, Chidchanok Lursinsap, and Shin'ichi Satoh</i>	

Object Detection and Recognition IV

Visual Recognition of Types of Structural Corridor Landmarks Using Vanishing Points Detection and Hidden Markov Models	3292
<i>Young-Bin Park, Sung Su Kim, and Il Hong Suh</i>	
Multi-object Segmentation in a Projection Plane Using Subtraction Stereo	3296
<i>Toru Ubukata, Kenji Terabayashi, Alessandro Moro, and Kazunori Umeda</i>	
Transitive Closure Based Visual Words for Point Matching in Video Sequence	3300
<i>Srikrishna Bhat K K, Marie-Odile Berger, Gilles Simon, and Frédéric Sur</i>	
Constrained Energy Minimization for Matching-Based Image Recognition	3304
<i>Tobias Gass, Phillippe Dreuw, and Hermann Ney</i>	
A Re-evaluation of Pedestrian Detection on Riemannian Manifolds	3308
<i>Diego Tosato, Michela Farenzena, Marco Cistani, and Vittorio Murino</i>	

Classification I

An Optimum Class-Rejective Decision Rule and Its Evaluation	3312
<i>Hoel Le Capitaine and Carl Frélicot</i>	
A Practical Heterogeneous Classifier for Relational Databases	3316
<i>Geetha Manjunath, M. Narasimha Murty, and Dinkar Sitaram</i>	

Spatial Representation for Efficient Sequence Classification	3320
<i>Pavel P. Kuksa and Vladimir Pavlovic</i>	
Rectifying Non-Euclidean Similarity Data Using Ricci Flow Embedding	3324
<i>Weiping Xu, Edwin R. Hancock, and Richard C. Wilson</i>	
One-Vs-All Training of Prototype Classifier for Pattern Classification and Retrieval	3328
<i>Cheng-Lin Liu</i>	

Computer Vision Applications I

Probabilistic Modeling of Dynamic Traffic Flow across Non-overlapping Camera Views	3332
<i>Ching-Chun Huang, Wei-Chen Chiu, Sheng-Jyh Wang, and Jen-Hui Chuang</i>	
Vehicle Recognition as Changes in Satellite Imagery	3336
<i>Özge Can Özcanlı and Joseph L. Mundy</i>	
Crowd Motion Analysis Using Linear Cyclic Pursuit	3340
<i>Viswanathan Srikrishnan and Subhasis Chaudhuri</i>	
Integrating Object Detection with 3D Tracking Towards a Better Driver Assistance System	3344
<i>Victor Adrian Prisacariu, Radu Timofte, Karel Zimmermann, Ian Reid, and Luc Van Gool</i>	
Real-Time Automatic Traffic Accident Recognition Using HFG	3348
<i>Samy Sadeky, Ayoub Al-Hamadiy, Bernd Michaelisy, and Usama Sayed</i>	

Semi-supervised and Metric Learning

Semi-supervised Distance Metric Learning by Quadratic Programming	3352
<i>Hakan Cevikalp</i>	
A Comparative Study on the Use of an Ensemble of Feature Extractors for the Automatic Design of Local Image Descriptors	3356
<i>Gustavo Carneiro</i>	
A Study on Combining Sets of Differently Measured Dissimilarities	3360
<i>Alessandro Ibba, Robert P.W. Duin, and Wan-Jui Lee</i>	
Efficient Kernel Learning from Constraints and Unlabeled Data	3364
<i>Mahdieh Soleymani Baghshah and Saeed Bagheri Shouraki</i>	
Semi-supervised Graph Learning: Near Strangers or Distant Relatives	3368
<i>Weifu Chen and Guocan Feng</i>	

Image Segmentation I

Robust Color Image Segmentation through Tensor Voting	3372
<i>Rodrigo Moreno, Miguel Angel Garcia, and Domenec Puig</i>	
An Improved Fluid Vector Flow for Cavity Segmentation in Chest Radiographs	3376
<i>Tao Xu, Irene Cheng, and Mrinal Mandal</i>	

Patchy Aurora Image Segmentation Based on ALBP and Block Threshold	3380
<i>Rong Fu, Xinbo Gao, and Yongjun Jian</i>	
Retinal Image Segmentation Based on Mumford-Shah Model and Gabor	
Wavelet Filter	3384
<i>Xiaojun Du and Tien D. Bui</i>	
On Selecting an Optimal Number of Clusters for Color Image Segmentation	3388
<i>Hoel Le Capitaine and Carl Frélicot</i>	

Face Ageing

Cross-Age Face Recognition on a Very Large Database: The Performance	
versus Age Intervals and Improvement Using Soft Biometric Traits	3392
<i>Guodong Guo, Guowang Mu, and Karl Ricanek</i>	
A Ranking Approach for Human Ages Estimation Based on Face Images	3396
<i>Kuang-Yu Chang, Chu-Song Chen, and Yi-Ping Hung</i>	
Perceived Age Estimation under Lighting Condition Change by Covariate	
Shift Adaptation	3400
<i>Kazuya Ueki, Masashi Sugiyama, and Yasuyuki Ihara</i>	
Ranking Model for Facial Age Estimation	3404
<i>Peng Yang, Lin Zhong, and Dimitris Metaxas</i>	
Development of Recognition Engine for Baby Faces	3408
<i>Di Wen, Chi Fang, Xiaoqing Ding, and Tong Zhang</i>	

Document Retrieval

An Information Extraction Model for Unconstrained Handwritten Documents	3412
<i>Simon Thomas, Clément Chatelain, Laurent Heutte, and Thierry Paquet</i>	
HMM-based Word Spotting in Handwritten Documents Using Subword	
Models	3416
<i>Andreas Fischer, Andreas Keller, Volkmar Frinken, and Horst Bunke</i>	
A Content Spotting System for Line Drawing Graphic Document Images	3420
<i>Muhammad Muzzamil Luqman, Thierry Brouard, Jean-Yves Ramel, and Josep Llódos</i>	
Toward Massive Scalability in Image Matching	3424
<i>Jorge Moraleda and Jonathan J. Hull</i>	
Learning Image Anchor Templates for Document Classification and Data	
Extraction	3428
<i>Prateek Sarkar</i>	

Image Analysis; Scene Understanding; Shape Modeling; Tracking and Surveillance; Vision Sensors

Sparse Embedding Visual Attention Systems Combined with Edge Information	3432
<i>Cairong Zhao, ChuanCai Liu, Zhihui Lai, and Jingyu Yang</i>	
LLN-based Model-Driven Validation of Data Points for Random Sample Consensus Methods	3436
<i>Liang Zhang and Demin Wang</i>	
Estimating 3D Human Pose from Single Images Using Iterative Refinement of the Prior	3440
<i>Ben Daubney and Xianghua Xie</i>	
Human-Area Segmentation by Selecting Similar Silhouette Images Based on Weak-Classifer Response	3444
<i>Hiroaki Ando and Hironobu Fujiyoshi</i>	
Local Optical Operators for Subpixel Scene Analysis	3448
<i>Yves D. Jean</i>	
Aesthetic Image Classification for Autonomous Agents	3452
<i>Mark Desnoyer and David Wettergreen</i>	
Removal of Moving Objects from a Street-View Image by Fusing Multiple Image Sequences	3456
<i>Hiroyuki Uchiyama, Daisuke Deguchi, Tomokazu Takahashi, Ichiro Ide, and Hiroshi Murase</i>	
Improving SIFT-based Descriptors Stability to Rotations	3460
<i>Fabio Bellavia, Domenico Tegolo, and Emanuele Trucco</i>	
Inpainting Large Missing Regions in Range Images	3464
<i>Arnav V Bhavsar and A.N. Rajagopalan</i>	
Angular Variation as a Monocular Cue for Spatial Perception	3468
<i>Joan Aranda and Agustin A. Navarro</i>	
An Exploration Scheme for Large Images: Application to Breast Cancer Grading	3472
<i>Antoine Veillard, Nicolas Loménie, and Daniel Racocceanu</i>	
3D Human Body Modeling Using Range Data	3476
<i>Koichiro Yamauchi, Bir Bhanu, and Hideo Saito</i>	
Scale Matching of 3D Point Clouds by Finding Keyscales with Spin Images	3480
<i>Toru Tamaki, Shunsuke Tanigawa, Yuji Ueno, Bisser Raytchev, and Kazufumi Kaneda</i>	
Tracking Multiple People with Illumination Maps	3484
<i>Gloria Zen, Oswald Lanz, Stefano Messelodi, and Elisa Ricci</i>	
Combining Foreground / Background Feature Points and Anisotropic Mean Shift For Enhanced Visual Object Tracking	3488
<i>Sebastian Haner and Irene Yu-Hua Gu</i>	

Enhanced Measurement Model for Subspace-Based Tracking	3492
<i>Shimin Yin, Haan Joo Yoo, and Jin Young Choi</i>	
Person-Specific Face Shape Estimation under Varying Head Pose from Single Snapshots	3496
<i>Fadi Dornaika and Bogdan Raducanu</i>	
Tracking Ships from Fast Moving Camera through Image Registration	3500
<i>Sergiy Fefilatyev, Dmitry Goldgof, and Chad Lembke</i>	
Boosted Multiple Kernel Learning for Scene Category Recognition	3504
<i>I-Hong Jhuo and D.T. Lee</i>	
Receding Horizon Estimation for Hybrid Particle Filters and Application for Robust Visual Tracking	3508
<i>Du Yong Kim, Ehwa Yang, Moongu Jeon, and Vladimir Shin</i>	
Efficient Polygonal Approximation of Digital Curves via Monte Carlo Optimization	3513
<i>Xiuzhuang Zhou and Yao Lu</i>	
Weakly Supervised Action Recognition Using Implicit Shape Models	3517
<i>Tuan Hue Thi, Li Cheng, Jian Zhang, Li Wang, and Shinichi Satoh</i>	
Moments of Elliptic Fourier Descriptors	3521
<i>Octavian Soldea, Mustafa Unel, and Aytul Ercil</i>	
Semi-supervised Trajectory Learning Using a Multi-Scale Key Point Based Trajectory Representation	3525
<i>Yang Liu, Xi Li, and Weiming Hu</i>	
Detection Based Low Frame Rate Human Tracking	3529
<i>Lu Wang and Nelson H.C. Yung</i>	
Detecting Dominant Motion Flows in Unstructured/Structured Crowd Scenes	3533
<i>Ovgu Ozturk, Toshihiko Yamasaki, and Kiyoharu Aizawa</i>	
Statistical Shape Modeling Using Morphological Representations	3537
<i>Santiago Velasco-Forero and Jesús Angulo</i>	
Recovering the Topology of Multiple Cameras by Finding Continuous Paths in a Trellis	3541
<i>Yinghao Cai, Kaiqi Huang, Tieniu Tan, and Matti Pietikäinen</i>	
On-Line Random Naive Bayes for Tracking	3545
<i>Martin Godec, Christian Leistner, Amir Saffari, and Horst Bischof</i>	
Interest Point Based Tracking	3549
<i>Werner Kloihofer and Martin Kampel</i>	
Stochastic Filtering of Level Sets for Curve Tracking	3553
<i>Christophe Avenel, Etienne Mémin, and Patrick Pérez</i>	
Scalable Cage-Driven Feature Detection and Shape Correspondence for 3D Point Sets	3557
<i>Lee M. Seversky and Lijun Yin</i>	

Event Recognition Based on Top-Down Motion Attention	3561
<i>LI Li, Weiming Hu, Bing Li, Chunfeng Yuan, Pengfei Zhu, and Wanqing Li</i>	
Construction of Precise Local Affine Frames	3565
<i>Andrej Mikulik, Jiri Matas, Michal Perdoch, and Ondrej Chum</i>	
Foreground Segmentation via Background Modeling on Riemannian Manifolds	3570
<i>Rui Caseiro, João F. Henriques, and Jorge Batista</i>	
Robust Human Behavior Modeling from Multiple Cameras	3575
<i>Dimitrios I. Kosmopoulos, Athanasios S. Voulodimos, and Theodora A. Varvarigou</i>	
Unsupervised Learning of Activities in Video Using Scene Context	3579
<i>Sangmin Oh and Anthony Hoogs</i>	
Multipath Interference Compensation in Time-of-Flight Camera Images	3583
<i>Stefan Fuchs</i>	
Segment-Based Foreground Extraction Dedicated to 3D Reconstruction	3587
<i>Jungwhan Kim, Anjin Park and Keechul Jung</i>	
Human Pose Estimation for Multiple Persons Based on Volume Reconstruction	3591
<i>Xinghan Luo, Berend Berendsen, Robby T. Tan, and Remco C. Veltkamp</i>	
3D Articulated Shape Segmentation Using Motion Information	3595
<i>Emre Kalafatlar and Yücel Yemez</i>	
Online Learning with Self-Organizing Maps for Anomaly Detection in Crowd Scenes	3599
<i>Jie Feng, Chao Zhang, and Pengwei Hao</i>	
Scene Classification Using Spatial Pyramid of Latent Topics	3603
<i>Emrah Ergul and Nafiz Arica</i>	
Optimization of Target Objects for Natural Feature Tracking	3607
<i>Lukas Gruber, Stefanie Zollmann, Daniel Wagner, Dieter Schmalstieg, and Tobias Höllerer</i>	
View-Invariant Action Recognition Using Rank Constraint	3611
<i>Nazim Ashraf, Yuping Shen, and Hassan Foroosh</i>	
Coarse-to-Fine Particle Filter by Implicit Motion Estimation for 3D Head Tracking on Mobile Devices	3615
<i>Hachoen Sung, Kwontaeg Choi, Sunyoung Cho, and Hyeran Byun</i>	
Visibility of Multiple Cameras in a Scene with Unknown Geometry	3619
<i>Liuxin Zhang and Yunde Jia</i>	
Low-Level Image Segmentation Based Scene Classification	3623
<i>Emre Akbas and Narendra Ahuja</i>	
Learning Scene Semantics Using Fiedler Embedding	3627
<i>Jingen Liu and Saad Ali</i>	
Counting Vehicles in Highway Surveillance Videos	3631
<i>Birgi Tamersoy and J.K. Aggarwal</i>	

Efficient 3D Upper Body Tracking with Self-Occlusions	3636
<i>Jixu Chen and Qiang Ji</i>	
Track Initialization in Low Frame Rate and Low Resolution Videos	3640
<i>Naresh P. Cuntoor, Arslan Basharat, A.G. Amitha Perera, and Anthony Hoogs</i>	
On the Performance of Handoff and Tracking in a Camera Network	3645
<i>Yiming Li, Bir Bhanu, and Vincent Nguyen</i>	
Object Tracking with Ratio Cycles Using Shape and Appearance Cues	3649
<i>M.E. Sargin, P. Ghosh, B.S. Manjunath, and K. Rose</i>	
Real-Time Abnormal Event Detection in Complicated Scenes	3653
<i>Yinghuan Shi, Yang Gao, and Ruili Wang</i>	
Human Computer Interaction and Biometrics	
Encoding Actions via Quantized Vocabulary of Averaged Silhouettes	3657
<i>Liang Wang and Christopher Leckie</i>	
Action Recognition Using Space-Time Shape Difference Images	3661
<i>Hao Qu, Liang Wang, and Christopher Leckie</i>	
A Brain Computer Interface for Communication Using Real-Time fMRI	3665
<i>Anders Eklund, Mats Andersson, Henrik Ohlsson, Anders Ynnerman, and Hans Knutsson</i>	
Combined Top-Down/Bottom-Up Human Articulated Pose Estimation Using AdaBoost Learning	3670
<i>Sheng Wang, Haizhou Ai, Takayoshi Yamashita, and Shihong Lao</i>	
The Human Action Image	3674
<i>Ricky J. Sethi and Amit K. Roy-Chowdhury</i>	
Combining Spatial and Temporal Information for Gait Based Gender Classification	3679
<i>Maodi Hu, Yunhong Wang, Zhaoxiang Zhang, and Yiding Wang</i>	
A Vision-Based Taiwanese Sign Language Recognition	3683
<i>Chung-Lin Huang and Bo-Lin Tsai</i>	
Fusing Audio-Visual Nonverbal Cues to Detect Dominant People in Group Conversations	3687
<i>Oya Aran and Daniel Gatica-Perez</i>	
Wavelet Domain Local Binary Pattern Features For Writer Identification	3691
<i>Liang Du, Xinge You, Huihui Xu, Zhifan Gao, and Yuanyan Tang</i>	
Audio-Visual Classification and Fusion of Spontaneous Affective Data in Likelihood Space	3695
<i>Mihalis A. Nicolaou, Hatice Gunes, and Maja Pantic</i>	
Improved Mandarin Keyword Spotting Using Confusion Garbage Model	3700
<i>Shilei Zhang, Zhiwei Shuang, Qin Shi, and Yong Qin</i>	
Human Activity Recognition Using Local Shape Descriptors	3704
<i>Sharath Venkatesha and Matthew Turk</i>	

Use of Line Spectral Frequencies for Emotion Recognition from Speech	3708
<i>Elif Bozkurt, Engin Erzin, Çiğdem Eroğlu Erdem, and A. Tanju Erdem</i>	
Spatially Regularized Common Spatial Patterns for EEG Classification	3712
<i>Fabien Lotte and Cuntai Guan</i>	
Comparing Multiple Classifiers for Speech-Based Detection of Self-Confidence - A Pilot Study	3716
<i>Jarek Krajewski, Anton Batliner, and Silke Kessel</i>	
Hierarchical Human Action Recognition by Normalized-Polar Histogram	3720
<i>Maryam Ziaefard and Hossein Ebrahimnezhad</i>	
Automatic 3D Facial Expression Recognition Based on a Bayesian Belief Net and a Statistical Facial Feature Model	3724
<i>Xi Zhao, Di Huang, Emmanuel Dellandréa, and Liming Chen</i>	
EEG-based Personal Identification: from Proof-of-Concept to A Practical System	3728
<i>Fei Su, Liwen Xia, Anni Cai, Yibing Wu, and Junshui Ma</i>	
Improved Facial Expression Recognition with Trainable 2-D Filters and Support Vector Machines	3732
<i>Peiyao Li, Son Lam Phung, Abdesselam Bouzerdoun, and Fok Hing Chi Tivive</i>	
A Biologically-Inspired Top-Down Learning Model Based on Visual Attention	3736
<i>Nong Sang, Longsheng Wei, and Yuehuan Wang</i>	
Human Action Recognition Using Segmented Skeletal Features	3740
<i>Sang Min Yoon and Arjan Kuijper</i>	
Action Recognition by Multiple Features and Hyper-Sphere Multi-class SVM	3744
<i>Jia Liu, Jie Yang, Yi Zhang, and Xiangjian He</i>	
Multimodal Recognition of Cognitive Workload for Multitasking in the Car	3748
<i>Felix Putze, Jan-Philip Jarvis, and Tanja Schultz</i>	
Automatic Facial Action Detection Using Histogram Variation Between Emotional States	3752
<i>Thibaud Senechal, Kevin Bailly, and Lionel Prevost</i>	
Decoding Finger Flexion from Electrographic Signals Using a Sparse Gaussian Process	3756
<i>Zuoguan Wang, Qiang Ji, Kai J. Miller, and Gerwin Schalk</i>	
Hand Pointing Estimation for Human Computer Interaction Based on Two Orthogonal-Views	3760
<i>Kaoning Hu, Shaun Canavan, and Lijun Yin</i>	
A Brain-Computer Interface for Mental Arithmetic Task from Single-Trial Near-Infrared Spectroscopy Brain Signals	3764
<i>Kai Keng Ang, Cuntai Guan, Kerry Lee, Jie Qi Lee, Shoko Nioka, and Britton Chance</i>	
Articulated Human Body: 3D Pose Estimation Using a Single Camera	3768
<i>Zibin Wang and Ronald Chung</i>	

Resampling Approach to Facial Expression Recognition Using 3D Meshes	3772
<i>Y.V. Venkatesh, Ashraf K. Kassim, and O.V. Ramana Murthy</i>	
Facial Expression Mimicking System	3776
<i>Ryuichi Fukui, Kouichi Katsurada, Yurie Iribe, and Tsuneo Nitta</i>	
A Framework for Hand Gesture Recognition and Spotting Using Sub-gesture Modeling	3780
<i>Manavender R. Malgireddy, Jason J. Corso, Srirangaraj Setlur, Venu Govindaraju, and Dinesh Mandalapu</i>	
Off-Line Signature Verification Using Graphical Model	3784
<i>Hairong Lv, Xinxin Bai, Wenjun Yin, and Jin Dong</i>	
Linear Facial Expression Transfer with Active Appearance Models	3789
<i>Miles de la Hunty, Akshay Asthana, and Roland Goecke</i>	
Fractal and Multi-fractal for Arabic Offline Writer Identification	3793
<i>Aymen Chaabouni, Houcine Boubaker, Monji Kherallah, Adel M. Alimi, and Haikal El Abed</i>	
A Simulation Study on the Generative Neural Ensemble Decoding Algorithms	3797
<i>Sung-Phil Kim, Min-Ki Kim, and Gwi-Tae Park</i>	
3D Active Shape Model for Automatic Facial Landmark Location Trained with Automatically Generated Landmark Points	3801
<i>Dianle Zhou, Dijana Petrovska-Delacrétaz, and Bernadette Dorizzi</i>	
Using Moments on Spatiotemporal Plane for Facial Expression Recognition	3806
<i>Yi Ji and Khalid Idrissi</i>	
Towards a More Realistic Appearance-Based Gait Representation for Gender Recognition	3810
<i>Raúl Martín-Félez, Ramón A. Mollineda, and J. Salvador Sánchez</i>	
A Calibration-Free Head Gesture Recognition System with Online Capability	3814
<i>Nils-Christian Wöhler, Ulf Großekathöfer, Angelika Dierker, Marc Hanheide, Stefan Kopp, and Thomas Hermann</i>	
Traj Align: A Method for Precise Matching of 3-D Trajectories	3818
<i>Zeyar Aung, Kelvin Sim, and Wee Siong Ng</i>	
Real-Time 3D Model-Based Gesture Tracking for Multimedia Control	3822
<i>Shih-Yao Lin, Yun-Chien Lai, Li-Wei Chan, and Yi-Ping Hung</i>	
Motif Discovery and Feature Selection for CRF-based Activity Recognition	3826
<i>Liyue Zhao, Xi Wang, Gita Sukthankar, and Rahul Sukthankar</i>	
On-Line Signature Verification Using 1-D Velocity-Based Directional Analysis	3830
<i>Muhammad Talal Ibrahim, Matthew Kyan, M. Aurangzeb Khan, and Ling Guan</i>	
Age Classification Base on Gait Using HMM	3834
<i>De Zhang, Yunhong Wang, and Bir Bhanu</i>	
Human Electrocardiogram for Biometrics Using DTW and FLDA	3838
<i>Venkatesh N and Srinivasan Jayaraman</i>	

Recognizing Sign Language from Brain Imaging	3842
<i>Nishant Ajay Mehta, Thad Starner, Melody Moore Jackson, Karolyn O. Babalola, and George Andrew James</i>	
American Sign Language Phrase Verification in an Educational Game for Deaf Children	3846
<i>Zahoor Zafrulla, Helene Brashear, Pei Yin, Peter Presti, Thad Starner, and Harley Hamilton</i>	
A Robust Method for Hand Gesture Segmentation and Recognition Using Forward Spotting Scheme in Conditional Random Fields	3850
<i>Mahmoud Elmezain, Ayoub Al-Hamadi, and Bernd Michaelis</i>	
Real-Time Upper-Limbs Posture Recognition Based on Particle Filters and AdaBoost Algorithms	3854
<i>Chin-Shyurng Fahn and Sheng-Lung Chiang</i>	
One-Lead ECG-based Personal Identification Using Ziv-Merhav Cross Parsing	3858
<i>David Pereira Coutinho, Ana L.N. Fred, and Mário A.T. Figueiredo</i>	
Multimodal Human Computer Interaction with MIDAS Intelligent Infokiosk	3862
<i>Alexey Karpov, Andrey Ronzhin, Irina Kipyatkova, Alexander Ronzhin, and Lale Akarun</i>	
View Invariant Body Pose Estimation Based on Biased Manifold Learning	3866
<i>Dongcheol Hur, Christian Wallraven, and Seong-Whan Lee</i>	
Visual Gaze Estimation by Joint Head and Eye Information	3870
<i>Roberto Valenti, Adel Lablack, Nicu Sebe, Chabane Djeraba, and Theo Gevers</i>	
Discrimination of Moderate and Acute Drowsiness Based on Spontaneous Facial Expressions	3874
<i>Esra Vural, Marian Bartlett, Gwen Littlewort, Mujdat Cetin, Aytul Ercil, and Javier Movellan</i>	
Object Detection and Recognition V	
Finding Multiple Object Instances with Occlusion	3878
<i>Ge Guo, Tingting Jiang, Yizhou Wang, and Wen Gao</i>	
Bag of Hierarchical Co-occurrence Features for Image Classification	3882
<i>Takumi Kobayashi and Nobuyuki Otsu</i>	
Person Detection Using Temporal and Geometric Context with a Pan Tilt Zoom Camera	3886
<i>Alberto Del Bimbo, Giuseppe Lisanti, Iacopo Masi, and Federico Pernici</i>	
Disparity Map Refinement for Video Based Scene Change Detection Using a Mobile Stereo Camera Platform	3890
<i>Hakan Haberdar and Shishir K. Shah</i>	
Using Symmetry to Select Fixation Points for Segmentation	3894
<i>Gert Kootstra, Niklas Bergström, and Danica Kragic</i>	

Classification II

Data Classification on Multiple Manifolds	3898
<i>Rui Xiao, Qijun Zhao, David Zhang, and Pengfei Shi</i>	
Unsupervised Ensemble Ranking: Application to Large-Scale Image Retrieval	3902
<i>Jung-Eun Lee, Rong Jin, and Anil K. Jain</i>	
Cross Entropy Optimization of the Random Set Framework for Multiple Instance Learning	3907
<i>Jeremy Bolton and Paul Gader</i>	
A Constant Average Time Algorithm to Allow Insertions in the LAESA Fast Nearest Neighbour Search Index	3911
<i>Luisa Micó and Jose Oncina</i>	
Feature Extraction from Discrete Attributes	3915
<i>Olcay Taner Yildiz</i>	

Computer Vision Applications II

Fire-Flame Detection Based on Fuzzy Finite Automation	3919
<i>SunJae Ham, ByoungChul Ko, and JaeYeal Nam</i>	
Extrinsic Camera Parameter Estimation Using Video Images and GPS Considering GPS Positioning Accuracy	3923
<i>Hideyuki Kume, Takafumi Taketomi, Tomokazu Sato, and Naokazu Yokoya</i>	
Combining Monocular and Stereo Cues for Mobile Robot Localization Using Visual Words	3927
<i>Friedrich Fraundorfer, Changchang Wu, and Marc Pollefeys</i>	
Fast Derivation of Soil Surface Roughness Parameters Using Multi-band SAR Imagery and the Integral Equation Model	3931
<i>Benjamin Seppke, Leonie Dreschler-Fischer, Jo-Ann Heiming, and Felix Wengenroth</i>	
Social Network Approach to Analysis of Soccer Game	3935
<i>Kyoung-Jin Park and Alper Yilmaz</i>	

Image Segmentation II

Robust Foreground Object Segmentation via Adaptive Region-Based Background Modelling	3939
<i>Vikas Reddy, Conrad Sanderson, and Brian C. Lovell</i>	
Flooding and MRF-based Algorithms for Interactive Segmentation	3943
<i>Ilias Grinias, Nikos Komodakis, and Georgios Tziritas</i>	
Steerable Filtering Using Novel Circular Harmonic Functions with Application to Edge Detection	3947
<i>Giuseppe Papari, Patrizio Campisi, and Nicolai Petkov</i>	
3D Vertebral Body Segmentation Using Shape Based Graph Cuts	3951
<i>Melih S. Aslan, Asem Ali, Aly A. Farag, Ham Rara, Ben Arnold, and Ping Xiang</i>	

Locally Deformable Shape Model to Improve 3D Level Set Based Esophagus Segmentation	3955
<i>Sila Kurugol, Necmiye Ozay, Jennifer G. Dy, Gregory C. Sharp, and Dana H. Brooks</i>	

3D Face Recognition

3D Face Reconstruction Using a Single or Multiple Views	3959
<i>Jongmoo Choi, Gérard Medioni, Yuping Lin, Luciano Silva, Olga Regina, Mauricio Pamplona, and Timothy C. Faltemier</i>	
Real-Time 3D Face and Facial Action Tracking Using Extended 2D+3D AAMs	3963
<i>Mingcai Zhou, Yangsheng Wang, and Xiangsheng Huang</i>	
A Novel Pose Invariant Face Recognition Approach Using a 2D-3D Searching Strategy	3967
<i>Nicholas Dahm and Yongsheng Gao</i>	
Initialization and Pose Alignment in Active Shape Model	3971
<i>Pengfei Xiong, Lei Huang, and Changping Liu</i>	
3D Face Recognition by Deforming the Normal Face	3975
<i>Xiaoli Li and Feipeng Da</i>	

Text Analysis and Detection

Text Detection Using Edge Gradient and Graph Spectrum	3979
<i>Jing Zhang and Rangachar Kasturi</i>	
Scene Text Extraction with Edge Constraint and Text Collinearity	3983
<i>SeongHun Lee, Min Su Cho, Kyomin Jung, and Jin Hyung Kim</i>	
Typographical Features for Scene Text Recognition	3987
<i>Jerod J. Weinman</i>	
A Visual Attention Based Approach to Text Extraction	3991
<i>Qiaoyu Sun, Yue Lu, and Shiliang Sun</i>	
New Wavelet and Color Features for Text Detection in Video	3996
<i>Palaiahnaktue Shivakumara, Trung Quy Phan, and Chew Lim Tan</i>	

Quantitative Biological Image and Signal Analysis

Improving Undersampled MRI Reconstruction Using Non-local Means	4000
<i>Ganesh Adluru, Tolga Tasdizen, Ross Whitaker, and Edward DiBella</i>	
Towards an Intelligent Bed Sensor: Non-intrusive Monitoring of Sleep Irregularities with Computer Vision Techniques	4004
<i>Kaveh Malakuti and Alexandra Branzan Albu</i>	
Automatic Selection of Keyframes from Angiogram Videos	4008
<i>T. Syeda-Mahmood, D. Beymer, F. Wang, A. Mahmood, R.J. Lundstrom, N. Shafee, and T. Holve</i>	

A Computer-Aided Method for Scoliosis Fusion Level Selection by a Topologically Ordered Self Organizing Kohonen Network	4012
<i>Neila Mezghani, Philippe Phan, Amar Mitiche, Hubert Labelle, and Jacques A. de Guise</i>	
A Fast and Robust Graph-Based Approach for Boundary Estimation of Fiber Bundles Relying on Fractional Anisotropy Maps	4016
<i>Miriam Helen Anna Bauer, Jan Egger, Tom O'Donnell, Sebastiano Barbieri, Jan Klein, Bernd Freisleben, Horst-Karl Hahn, and Christopher Nimsky</i>	

Object Detection and Recognition VI

Recognizing 3D Objects with 3D Information from Stereo Vision	4020
<i>Kuk-Jin Yoon, Min-Gil Shin, and Ji-Hyo Lee</i>	
Combining Geometry and Local Appearance for Object Detection	4024
<i>Manuel Pascual García-Tubío, Horst Wildenauer, and Lech Szumilas</i>	
Illumination and Expression Invariant Recognition Using SSIM Based Sparse Representation	4028
<i>Asim Khwaja, Akshay Asthana, and Roland Goecke</i>	
Improving Classification Accuracy by Comparing Local Features through Canonical Correlations	4032
<i>Mert Dikmen and Thomas S. Huang</i>	
A Robust Approach for Person Localization in Multi-camera Environment	4036
<i>Luo Sun, Huijun Di, Linmi Tao, and Guangyou Xu</i>	

Classification III

Nearest Archetype Hull Methods for Large-Scale Data Classification	4040
<i>Christian Thureau</i>	
A Bound on the Performance of LDA in Randomly Projected Data Spaces	4044
<i>Robert J. Durrant and Ata Kabán</i>	
Adaptive Incremental Learning with an Ensemble of Support Vector Machines	4048
<i>Marcelo N. Kapp, Robert Sabourin, and Patrick Maupin</i>	
Margin Preserved Approximate Convex Hulls for Classification	4052
<i>Tetsuji Takahashi and Mineichi Kudo</i>	
Evolving Fuzzy Classifiers: Application to Incremental Learning of Handwritten Gesture Recognition Systems	4056
<i>Abdullah Almaksour, Eric Anquetil, Solen Quiniou, and Mohamed Cheriet</i>	

Computer Vision Applications III

Fast and Spatially-Smooth Terrain Classification Using Monocular Camera	4060
<i>Chetan J., Madhava Krishna, and C. V. Jawahar</i>	
Learning Major Pedestrian Flows in Crowded Scenes	4064
<i>Peter Widhalm and Norbert Brändle</i>	
On-Line Video Recognition and Counting of Harmful Insects	4068
<i>Ikhlef Bechar, Sabine Moisan, Monique Thonnat, and François Bremond</i>	

Boosted Edge Orientation Histograms for Grasping Point Detection	4072
<i>Leonidas Lefakis, Horst Wildenauer, Manuel Pascual García-Tubío, and Lech Szumilas</i>	
Automatic Refinement of Foreground Regions for Robot Trail Following	4077
<i>Mehmet Kemal Kocamaz and Christopher Rasmussen</i>	

Image Representation and Analysis

Object Decomposition Via Curvilinear Skeleton Partition	4081
<i>Luca Serino, Gabriella Sanniti di Baja, and Carlo Arcelli</i>	
Differential Area Profiles	4085
<i>Georgios K. Ouzounis and Pierre Soille</i>	
Connected Component Trees for Multivariate Image Processing and Applications in Astronomy	4089
<i>Benjamin Perret, Sébastien Lefèvre, Christophe Collet, and Eric Slezak</i>	
Multiresolution Analysis of 3D Images Based on Discrete Distortion	4093
<i>Kenneth Weiss, Leila De Florian, and Mohammed Mostefa Mesmoudi</i>	
Multiscale Analysis of Digital Segments by Intersection of 2D Digital Lines	4097
<i>Mouhammad Said, Jacques-Olivier Lachaud, and Fabien Feschet</i>	

Image/Video Processing

Stereoscopic Image Inpainting: Distinct Depth Maps and Images Inpainting	4101
<i>Alexandre Hervieu, Nicolas Papadakis, Aurélie Bugeau, Pau Gargallo, and Vicent Caselles</i>	
Panoramic Video Generation by Multi View Data Synthesis	4105
<i>Tiziana D'Orazio, Marco Leo, and Nicola Mosca</i>	
An Adaptive True Motion Estimation Algorithm for Frame Rate Conversion of High Definition Video	4109
<i>Mert Cetin and Ilker Hamzaoglu</i>	
Human Daily Activities Indexing in Videos from Wearable Cameras for Monitoring of Patients with Dementia Diseases	4113
<i>Svebor Karaman, Jenny Benois-Pineau, Rémi Mégret, Vladislavs Dovgalecs, Jean-François Dartigues, and Yann Gaëstel</i>	
Automatic Composition of an Informative Wide-View Image from Video	4117
<i>Hitoshi Habe, Shota Makiyama, and Masatsugu Kidode</i>	

Facial Expression

Regression-Based Multi-view Facial Expression Recognition	4121
<i>Ognjen Rudovic, Ioannis Patras, and Maja Pantic</i>	
A Set of Selected SIFT Features for 3D Facial Expression Recognition	4125
<i>Stefano Berretti, Alberto Del Bimbo, Pietro Pala, Boulbaba Ben Amor, and Mohamed Daoudi</i>	
Local 3D Shape Analysis for Facial Expression Recognition	4129
<i>Ahmed Maalej, Boulbaba Ben Amor, Mohamed Daoudi, Anuj Srivastava, and Stefano Berretti</i>	

Multi-modal Emotion Recognition Using Canonical Correlations and Acoustic Features	4133
<i>Rok Gajšek, Vitomir Štruc, and France Mihelič</i>	

Multimedia and Document Analysis Applications

Automatic Music Genre Classification Using Bass Lines	4137
<i>Umut Şimşekli</i>	
Exploiting Combined Multi-level Model for Document Sentiment Analysis	4141
<i>Si Li, Hao Zhang, Weiran Xu, Guang Chen, and Jun Guo</i>	
MONORAIL: A Disk-Friendly Index for Huge Descriptor Databases	4145
<i>Fernando Akune, Eduardo Valle, and Ricardo Torres</i>	
Localized Supervised Metric Learning on Temporal Physiological Data	4149
<i>Jimeng Sun, Daby Sow, Jianying Hu, and Shahram Ebadollahi</i>	
Automatic Detection of Phishing Target from Phishing Webpage	4153
<i>Gang Liu, Bite Qiu, and Liu Wenyin</i>	

Pattern Recognition Systems and Applications III

Underwater Mine Classification with Imperfect Labels	4157
<i>David P. Williams</i>	
Optimizing Optimum-Path Forest Classification for Huge Datasets	4162
<i>João P. Papa, Fábio A.M. Cappabianco, and Alexandre Xavier Falcão</i>	
Model-Based Detection of Acoustically Dense Objects in Ultrasound	4166
<i>Jyotirmoy Banerjee and Kajoli B. Krishnan</i>	
SubXPCA versus PCA: A Theoretical Investigation	4170
<i>Atul Negi and Vijaya Kumar Kadappa</i>	
Feature Extraction Based on Class Mean Embedding (CME)	4174
<i>Minghua Wan, Zhihui Lai, and Zhong Jin</i>	
Forest Species Recognition Using Color-Based Features	4178
<i>Pedro Luiz de Paula, Luiz S. Oliveira, Alceu de Souza Britto Jr., and Robert Sabourin</i>	
An Information Theoretic Linear Discriminant Analysis Method	4182
<i>Haihong Zhang, Cuntai Guan, and Kai Keng Ang</i>	
Framewise Phone Classification Using Weighted Fuzzy Classification Rules	4186
<i>Omid Dehzangi, Bin Ma, Eng Siong Chng, and Haizhou Li</i>	
Statistical Fourier Descriptors for Defect Image Classification	4190
<i>Fabian Timm and Thomas Martinetz</i>	
A Measure of Competence Based on Randomized Reference Classifier for Dynamic Ensemble Selection	4194
<i>Tomasz Wołoszynski and Marek Kurzynski</i>	
Information Theory Based WCE Video Summarization	4198
<i>Giovanni Gallo, Eliana Granata, and Alessandro Torrisi</i>	

An LDA-based Relative Hysteresis Classifier with Application to Segmentation of Retinal Vessels	4202
<i>Alexandru Paul Condurache, Florian Müller, and Alfred Mertins</i>	
An Offline Map Matching via Integer Programming	4206
<i>Hiroki Yanagisawa</i>	
Invisible Calibration Pattern Based on Human Visual Perception Characteristics	4210
<i>Hironori Takimoto, Seiki Yoshimori, Yasue Mitsukura, and Minoru Fukumi</i>	
Boosting Gray Codes for Red Eyes Removal	4214
<i>S. Battiato, G.M. Farinella, M. Guarnera, G. Messina, and D. Ravi</i>	
A New Rotation Feature for Single Tri-axial Accelerometer Based 3D Spatial Handwritten Digit Recognition	4218
<i>Yang Xue and Lianwen Jin</i>	
Improved Mean Shift Algorithm with Heterogeneous Node Weights	4222
<i>Ji Won Yoon and Simon P. Wilson</i>	
Word Clustering Using PLSA Enhanced with Long Distance Bigrams	4226
<i>Bassiou Nikoletta and Kotropoulos Constantine</i>	
Scene Classification Using Local Co-occurrence Feature in Subspace Obtained by KPCA of Local Blob Visual Words	4230
<i>Kazuhiro Hotta</i>	
Recognition and Prediction of Situations in Urban Traffic Scenarios	4234
<i>Eugen Käfer, Christoph Hermes, Christian Wöhler, Franz Kummert, and Helge Ritter</i>	
Employing Decoding of Specific Error Correcting Codes as a New Classification Criterion in Multiclass Learning Problems	4238
<i>Yurong Luo and Kayvan Najarian</i>	
EEG-based Emotion Recognition Using Self-Organizing Map for Boundary Detection	4242
<i>Reza Khosrowabadi, Hiok Chai Quek, Abdul Wahab, and Kai Keng Ang</i>	
Vocabulary-Based Approaches for Multiple-Instance Data: A Comparative Study	4246
<i>Jaume Amores</i>	
A Multiple Classifier System Approach for Facial Expressions in Image Sequences Utilizing GMM Supervectors	4251
<i>Martin Schels and Friedhelm Schwenker</i>	
Incremental Learning of Visual Landmarks for Mobile Robotics	4255
<i>Antonio Bandera, Rebeca Marfil, and Ricardo Vazquez-Martin</i>	
Subspace Methods with Globally/Locally Weighted Correlation Matrix	4259
<i>Yukihiko Yamashita and Toru Wakahara</i>	
The Binormal Assumption on Precision-Recall Curves	4263
<i>Kay Henning Brodersen, Cheng Soon Ong, Klaas Enno Stephan, and Joachim M. Buhmann</i>	

Incremental Training of Multiclass Support Vector Machines	4267
<i>Symeon Nikitidis, Nikos Nikolaidis, and Ioannis Pitas</i>	
User Adaptive Clustering for Large Image Databases	4271
<i>Mohammad Mehdi Saboorian, Mansour Jamzad, and Hamid R. Rabiee</i>	
Alignment-Based Similarity of People Trajectories Using Semi-directional Statistics	4275
<i>Simone Calderara, Andrea Prati, and Rita Cucchiara</i>	
Contact Lens Detection Based on Weighted LBP	4279
<i>Hui Zhang, Zhenan Sun, and Tieniu Tan</i>	
Integrating ILSR to Bag-of-Visual Words Model Based on Sparse Codes of SIFT Features Representations	4283
<i>Lina Wu, Siwei Luo, Wei Sun, and Xiang Zheng</i>	
Heteroscedastic Multilinear Discriminant Analysis for Face Recognition	4287
<i>Mehran Safayani and Mohammad Taghi Manzuri Shalmani</i>	
Applying Error-Correcting Output Coding to Enhance Convolutional Neural Network for Target Detection and Pattern Recognition	4291
<i>Huiqun Deng, George Stathopoulos, and Ching Y. Suen</i>	
Action Recognition Using Direction Models of Motion	4295
<i>Yassine Benabbas, Adel Lablack, Nacim Ihaddadene, and Chabane Djeraba</i>	
Boolean Combination of Classifiers in the ROC Space	4299
<i>Wael Khreich, Eric Granger, Ali Miri, and Robert Sabourin</i>	
Stereo-Based Multi-person Tracking Using Overlapping Silhouette Templates	4304
<i>Junji Satake and Jun Miura</i>	
Characterising Facial Gender Difference Using Fisher-Rao Metric	4308
<i>Simone Ceolin and Edwin R. Hancock</i>	
On-Line fMRI Data Classification Using Linear and Ensemble Classifiers	4312
<i>Catrin O. Plumptre, Ludmila I. Kuncheva, David E.J. Linden, and Stephen J. Johnston</i>	
Adaptive Feature and Score Level Fusion Strategy Using Genetic Algorithms	4316
<i>Wael Ben Soltana, Mohsen Ardabilian, Liming Chen, and Chokri Ben Amar</i>	
Local Binary Pattern-Based Features for Text Identification of Web Images	4320
<i>Insook Jung and Il-Seok Oh</i>	
Classification of Polarimetric SAR Images Using Evolutionary RBF Networks	4324
<i>Turker Ince, Serkan Kiranyaz, and Moncef Gabbouj</i>	
On the Use of Median String for Multi-source Translation	4328
<i>Jesús González-Rubio and Francisco Casacuberta</i>	
A Lip Contour Extraction Method Using Localized Active Contour Model with Automatic Parameter Selection	4332
<i>Xin Liu, Yiu-ming Cheung, Meng Li, and Hailin Liu</i>	
Multimodal Sleeping Posture Classification	4336
<i>Weimin Huang, Aung Aung Phyto Wai, Siang Fook Foo, Jit Biswas, Chi-Chun Hsia, and Koujuch Liou</i>	

Exploiting System Knowledge to Improve ECOC Reject Rules	4340
<i>Paolo Simeone, Claudio Marrocco, and Francesco Tortorella</i>	
Human Smoking Event Detection Using Visual Interaction Clues	4344
<i>Pin Wu, Jun-Wei Hsieh, Jiun-Cheng Cheng, Shyi-Chyi Cheng, and Shau-Yin Tseng</i>	
Malware Detection on Mobile Devices Using Distributed Machine Learning	4348
<i>Ashkan Sharifi Shamili, Christian Bauckhage, and Tansu Alpcan</i>	
Combining Single Class Features for Improving Performance of a Two Stage Classifier	4352
<i>Luigi P. Cordella, Claudio De Stefano, Francesco Fontanella, Cristina Marrocco, and Alessandra Scotto di Freca</i>	
The Rex Leopold II Model: Application of the Reduced Set Density Estimator to Human Categorization.	4356
<i>Maarten De Schryver and Bjorn Roelstraete</i>	
A Hybrid Method for Feature Selection Based on Mutual Information and Canonical Correlation Analysis	4360
<i>C. Okan Sakar and Olcay Kursun</i>	
Speech Magnitude-Spectrum Information-Entropy (MSIE) for Automatic Speech Recognition in Noisy Environments	4364
<i>Juan A. Nolasco-Flores, Roberto A. Aceves L., and L. Paola García-Perera</i>	
Unsupervised Image Retrieval with Similar Lighting Conditions	4368
<i>J. Felix Serrano, Carlos Aviles, Humberto Sossa, Juan Villegas, and Gustavo Olague</i>	
Lattice-Based Anomaly Rectification for Sport Video Annotation	4372
<i>Aftab Khan, David Windridge, Teofilo de Campos, Josef Kittler, and William Christmas</i>	
An Ensemble of Classifiers Approach to Steganalysis	4376
<i>Sevinc Bayram, Ahmet Emir Dirik, Husrev Taha Sencar, and Nasir Memon</i>	
Discriminating Intended Human Objects in Consumer Videos	4380
<i>Hiroshi Uegaki, Yuta Nakashima, and Noboru Babaguchi</i>	
Detecting Human Activity Profiles with Dirichlet Enhanced Inhomogeneous Poisson Processes	4384
<i>Masamichi Shimosaka, Takahito Ishino, Hiroshi Noguchi, Tomomasa Sato, and Taketoshi Mori</i>	
I-FAC: Efficient Fuzzy Associative Classifier for Object Classes in Images	4388
<i>Ashish Mangalampalli, Vineet Chaoji, and Subhajit Sanyal</i>	
Audio-Visual Data Fusion Using a Particle Filter in the Application of Face Recognition	4392
<i>Michael Alan Steer, Ayoub Al-Hamadi, and Bernd Michaelis</i>	
The Problem of Fragile Feature Subset Preference in Feature Selection Methods and a Proposal of Algorithmic Workaround	4396
<i>Petr Somol, Jiri Grim, and Pavel Pudil</i>	

Signal, Speech and Image Processing

Removing Partial Occlusion from Blurred Thin Occluders	4400
<i>Scott McCloskey, Michael Langer, and Kaleem Siddiqi</i>	
A New Approach to Aircraft Surface Inspection Based on Directional Energies of Texture	4404
<i>Mustafa Mumtaz, Atif Bin Mansoor, and Hassan Masood</i>	
A Generalized Anisotropic Diffusion for Defect Detection in Low-Contrast Surfaces	4408
<i>Shin-Min Chao, Du-Ming Tsai, Wei-Chen Li, and Wei-Yao Chiu</i>	
Impact of Vector Ordering Strategies on Morphological Unmixing of Remotely Sensed Hyperspectral Images	4412
<i>Antonio Plaza and Javier Plaza</i>	
A Recursive and Model-Constrained Region Splitting Algorithm for Cell Clump Decomposition	4416
<i>Wei Xiong, Sim-Heng Ong, and Joo-Hwee Lim</i>	
Bounding-Box Based Segmentation with Single Min-cut Using Distant Pixel Similarity	4420
<i>Viet-Quoc Pham, Keita Takahashi, and Takeshi Naemura</i>	
Image Retargeting in Compressed Domain	4424
<i>O.V. Ramana Murthy, Karthik Muthuswamy, Deepu Rajan, and Chia Liang Tien</i>	
Progressive MAP-based Deconvolution with Pixel-Dependent Gaussian Prior	4428
<i>Masayuki Tanaka, Takafumi Kanda, and Masatoshi Okutomi</i>	
A Fast Image Inpainting Method Based on Hybrid Similarity-Distance	4432
<i>Jie Liu, Shuwu Zhang, Wuyi Yang, and Heping Li</i>	
Reversible Interger 2-D Discrete Fourier Transform by Control Bits	4436
<i>Serkan Dursun and Artyom M. Grigoryan</i>	
Image Inpainting Based on Local Optimisation	4440
<i>Jun Zhou and Antonio Robles-Kelly</i>	
Image Processing Based Approach for Retrieving Data from a Seismic Section in Bitmap Format	4444
<i>Dan Chevion, Yaakov Navon, and Dov Ramm</i>	
Visible Entropy: A Measure for Image Visibility	4448
<i>Zujun Hou and Wei-Yun Yau</i>	
Research the Performance of a Recursive Algorithm of the Local Discrete Wavelet Transform	4452
<i>Vasily N. Kopenkov and Vladislav V. Myasnikov</i>	
Auditory Features Revisited for Robust Speech Recognition	4456
<i>Finnian Kelly and Naomi Harte</i>	
Sparse Representation for Speaker Identification	4460
<i>Imran Naseem, Roberto Togneri, and Mohammed Bennamoun</i>	

Latency in Speech Feature Analysis for Telepresence Event Coding	4464
<i>Lawrence O'Gorman</i>	
Automatically Detecting Peaks in Terahertz Time-Domain Spectroscopy	4468
<i>Henrike Stephani, Joachim Jonuscheit, Christoph Robiné, and Bettina Heise</i>	
Iwasawa Decomposition and Computational Riemannian Geometry	4472
<i>Reiner Lenz, Rika Mochizuki, and Jinhui Chao</i>	
Rethinking Algorithm Design and Development in Speech Processing	4476
<i>Thilo Stadelmann, Yinghui Wang, Matthew Smith, Ralph Ewerth, and Bernd Freisleben</i>	
Phone-Conditioned Suboptimal Wiener Filtering	4480
<i>Guillermo Gonzalez-Caravaca, Doroteo Torre Toledano, and Maria Puertas</i>	
Geodesic Active Fields on the Sphere	4484
<i>Dominique Zosso and Jean-Philippe Thiran</i>	
Emotional Speech Classification Based on Multi View Characterization	4488
<i>Ammar Mahdhaoui and Mohamed Chetouani</i>	
Image Inpainting Using Structure-Guided Priority Belief Propagation and Label Transformations	4492
<i>Heng-Feng Hsin, Jin-Jang Leou, Cheng-Shian Lin, and Hsuan-Ying Chen</i>	
Comparison of Syllable/Phone HMM Based Mandarin TTS	4496
<i>Quansheng Duan, Shiyin Kang, Zhiyong Wu, Lianhong Cai, Zhiwei Shuang, and Yong Qin</i>	
QRS Complex Detection by Non Linear Thresholding of Modulus Maxima	4500
<i>Jalil Bushra, Beya Ouadi, Fauvet Eric, and Laligant Olivier</i>	
Crossmodal Matching of Speakers Using Lip and Voice Features in Temporally Non-overlapping Audio and Video Streams	4504
<i>Anindya Roy and Sebastien Marcel</i>	
Image Parsing with a Three-State Series Neural Network Classifier	4508
<i>Mojtaba Seyedhosseini, António R.C. Paiva, and Tolga Tasdizen</i>	
Pan-Sharpening Using an Adaptive Linear Model	4512
<i>Lining Liu, Yiding Wang, Yunhong Wang, and Haiyan Yu</i>	
A Study of Voice Source and Vocal Tract Filter Based Features in Cognitive Load Classification	4516
<i>Phu Ngoc Le, Julien Epps, Eric H.C. Choi, and Eliathamby Ambikairajah</i>	
Adaptive Enhancement with Speckle Reduction for SAR Images Using Mirror-Extended Curvelet and PSO	4520
<i>Ying Li, Hongli Gong, and Qing Wang</i>	
Recursive Video Matting and Denoising	4524
<i>Sahana M. Prabhu and A.N. Rajagopalan</i>	
The Effects of Radiometry on the Accuracy of Intensity Based Registration	4528
<i>Boris Peter Selby, Georgios Sakas, Stefan Walter, Wolf-Dieter Groch, and Uwe Stilla</i>	
Fence Removal from Multi-focus Images	4532
<i>Atsushi Yamashita, Akiyoshi Matsui, and Toru Kaneko</i>	

Information Theoretic Expectation Maximization Based Gaussian Mixture Modeling for Speaker Verification	4536
<i>Sheeraz Memon, Margaret Lech, and Namunu Maddage</i>	
A Gaussian Process Regression Framework for Spatial Error Concealment with Adaptive Kernels	4541
<i>Hadi Asheri, Hamid R. Rabiee, Nima Pourdehghani, and Mohammad H. Rohban</i>	
Colour Constant Image Sharpening	4545
<i>Ali Alsam</i>	
Maximally Stable Texture Regions	4549
<i>Mesut Güney and Nafiz Arica</i>	
Combining the Likelihood and the Kullback-Leibler Distance in Estimating the Universal Background Model for Speaker Verification Using SVM	4553
<i>Zhenchun Lei</i>	
Asymmetric Generalized Gaussian Mixture Models and EM Algorithm for Image Segmentation	4557
<i>Nafaa Nacereddine, Salvatore Tabbone, Djemel Ziou, and Latifa Hamami</i>	
Color Connectedness Degree for Mean-Shift Tracking	4561
<i>Michèle Gouiffes, Florence Laguzet, and Lionel Lacassagne</i>	
Signal-to-Signal Ratio Independent Speaker Identification for Co-channel Speech Signals	4565
<i>Rahim Saeidi, Pejman Mowlae, Tomi Kinnunen, Zheng-Hua Tan, Mads Græsbøll Christensen, Søren Holdt Jensen, and Pasi Fränti</i>	
Selection of Training Instances for Music Genre Classification	4569
<i>Miguel Lopes, Fabien Gouyon, Alessandro L. Koerich, and Luiz E.S. Oliveira</i>	
Semi-blind Speech-Music Separation Using Sparsity and Continuity Priors	4573
<i>Hakan Erdogan and Emad M. Grais</i>	
Comparative Analysis for Detecting Objects Under Cast Shadows in Video Images	4577
<i>Jorge Scandaliaris, Michael Villamizar, and Alberto Sanfeliu</i>	
Shape-Appearance Guided Level-Set Deformable Model for Image Segmentation	4581
<i>Fahmi Khalifa, Ayman El-Baz, Georgy Gimel'farb, Rosemary Ouseph, and Mohamed Abu El-Ghar</i>	
Iterative Ramp Sharpening for Structure/Signature-Preserving Simplification of Images	4585
<i>Jacopo Grazzini and Pierre Soille</i>	
Learning Naive Bayes Classifiers for Music Classification and Retrieval	4589
<i>Zhouyu Fu, Guojun Lu, Kai Ming Ting, and Dengsheng Zhang</i>	
An Empirical Study of Feature Extraction Methods for Audio Classification	4593
<i>Charles Parker</i>	

Geometric Total Variation for Texture Deformation	4597
<i>Dmitriy Bespalov, Anders Dahl, and Ali Shokoufandeh</i>	
A Novel Approach to Detect Ship-Radiated Signal Based on HMT	4601
<i>Yue Zhou, Zhibin Niu, and Chenghao Wang</i>	
Speech Emotion Analysis in Noisy Real-World Environment	4605
<i>Ashish Tawari and Mohan M. Trivedi</i>	
Sampling and Ideal Reconstruction on the 3D Diamond Grid	4609
<i>Robin Strand</i>	
Detecting Faint Compact Sources Using Local Features and a Boosting Approach	4613
<i>A. Torrent, M. Peracaula, X. Lladó, J. Freixenet, J.R. Sànchez-Sutil, J. Martí, and J.M. Paredes</i>	
Automatic Hair Detection in the Wild	4617
<i>P. Julian, Christophe Dehais, François Lauze, Vincent Charvillat, Adrien Bartoli, and Ariel Choukroun</i>	
De-noising of SR μ CT Fiber Images by Total Variation Minimization	4621
<i>Joakim Lindblad, Nataša Sladoje, and Tibor Lukić</i>	

Author Index