

# **2015 3rd IAPR Asian Conference on Pattern Recognition (ACPR 2015)**

**Kuala Lumpur, Malaysia  
3-6 November 2015**



IEEE Catalog Number: CFP1589N-POD  
ISBN: 978-1-4799-6101-6

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

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

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

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

IEEE Catalog Number:	CFP1589N-POD
ISBN (Print-On-Demand):	978-1-4799-6101-6
ISBN (Online):	978-1-4799-6100-9
ISSN:	2327-0977

**Additional Copies of This Publication Are Available From:**

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

# **2015 Third IAPR**

## **Asian Conference on**

## **Pattern Recognition**

# **ACPR 2015**

## **Table of Contents**

Message from ACPR 2015 Chair.....	xiv
ACPR 2015 Organizing Committee.....	xv
Sponsors .....	xvi
IAPR Keynote Lecture 1.....	xvii
IAPR Keynote Lecture 2.....	xviii
IAPR Keynote Lecture 3.....	xix
IAPR Keynote Lecture 4.....	xx
Tutorial.....	xi
Workshops.....	xxii

---

## **Oral Session 1 – Faces and Persons**

Simultaneous Blurred Face Restoration and Recognition..... <i>Jun Li, Shasha Li, Jiani Hu and Weihong Deng</i>	1
Hallucination Space Relationship Learning to Improve Very Low Resolution Face Recognition..... <i>Juhyun Ahn, Daijin Kim and Sue Inn Ch'ng</i>	6
Robust Local Representation for Face Recognition with Single Sample Per Person..... <i>Xing Wang, Meng Yang, Linlin Shen and Heyou Chang</i>	11
Joint Space Learning for Video-based Face Recognition..... <i>Dong Cao, Ran He, Zhenan Sun and Tieniu Tan</i>	16
DeNet: An Explicit Distance Ensemble Model for Person Re-identification..... <i>Jin Wang, Changxin Gao, Jing Hu and Nong Sang</i>	21

Depth-based Person Re-identification.....	26
<i>Ancong Wu, Wei-Shi Zheng and Jian-Huang Lai</i>	

## **Oral Session 2 – Object Recognition**

Enhancing RGB CNNs with Depth.....	31
<i>Arjun Sharma and Pramod Sankar K</i>	
Multi-staged Deep Learning with Created Coarse and Appended Fine Categories.....	36
<i>Reiko Hagawa, Yasunori Ishii and Sotaro Tsukizawa</i>	
Structure-driven Facade Parsing With Irregular Patterns.....	41
<i>Jinglu Wang, Chun Liu, Tianwei Shen and Long Quan</i>	
Video-based Object Recognition with Weakly Supervised Object Localization.....	46
<i>Yang Liu, Rigas Kouskouridas and Tae-Kyun Kim</i>	
Mirrored Non-Maximum Suppression for Accurate Object Part Localization.....	51
<i>Lianrui Fu, Junge Zhang and Kaiqi Huang</i>	

## **Poster Session 1**

Unsupervised Daily Routine Modelling from a Depth Sensor using Bottom-Up and Top-Down Hierarchies.....	56
<i>Yangdi Xu, Dave Bull and Dima Damen</i>	
An Extension of PatchMatch Stereo for 3D Reconstruction from Multi-View Images.....	61
<i>Mutsuki Hiradate, Koichi Ito, Takafumi Aoki, Takafumi Watanabe and Hiroki Unten</i>	
Spatial Distribution Feature for 3D Indoor Scene Labelling.....	66
<i>Yankun Lang, Haiyuan Wu and Qian Chen</i>	
Video-level Violence Rating with Rank Prediction.....	71
<i>Yu Wang and Jien Kato</i>	
WA-ICP Algorithm for Tackling Ambiguous Correspondence.....	76
<i>Rong Wang and Zheng Geng</i>	
Color Reprint for Hypochromatopsia Correction.....	81
<i>Li-Qi Chen, Huei-Yung Lin and Min-Liang Wang</i>	
Person Re-Identification Using Color Enhancing Feature.....	86
<i>Peng Li, Haiyuan Wu, Qian Chen and Chongke Bi</i>	
Online Selection of Discriminative Features with Approximated Distribution Fields for Efficient Object Tracking.....	91
<i>Qiang Guo, Chendong Wu and Yingchun Zhao</i>	
Traffic Sign Detection from Video: A Fast Approach with Tracking.....	96
<i>Dongdong Wang, Xinwen Hou and Cheng-Lin Liu</i>	
Action Recognition by Single Stream Convolutional Neural Networks: An Approach using Combined Motion and Static Information.....	101
<i>Sameera Ramasinghe and Ranga Rodrigo</i>	
Exploiting High-Speed Sequences for Background Subtraction.....	106
<i>Niklas Bergstrom, Nils Ståhl and Masatoshi Ishikawa</i>	

Multi-attribute Learning for Pedestrian Attribute Recognition in Surveillance Scenarios.....	111
<i>Dangwei Li, Xiaotang Chen and Kaiqi Huang</i>	
Practical Pose Normalizaiton for Pose-Invariant Face Recognition.....	116
<i>Zhongjun Wu, Shan Li and Weihong Deng</i>	
Deep Neural Networks for Recognizing Online Handwritten Mathematical Symbols.....	121
<i>Hai Nguyen, Anh Le and Masaki Nakagawa</i>	
Principal Affinity based Cross-Modal Retrieval.....	126
<i>Jian Liang, Dong Cao, Ran He, Zhenan Sun and Tieniu Tan</i>	
A Hybrid Method for Table Detection from Document Image.....	131
<i>Anh Tran, In-Seop Na and Soo-Hyung Kim</i>	
Real-time Sign Language Fingerspelling Recognition using Convolutional Neural Networks from Depth Map.....	136
<i>Byeongkeun Kang, Subarna Tripathi and Truong Nguyen</i>	
Learning Temporal Features Using LSTM-CNN Architecture for Face Anti-spoofing.....	141
<i>Zhenqi Xu, Shan Li and Weihong Deng</i>	
Towards a Segmentation and Recognition-free Approach for Content-based Document Image Retrieval of Handwritten Queries.....	146
<i>Houssem Chatbri, Keisuke Kameyama and Paul Kwan</i>	
Script Independent Scene Text Segmentation using Fast Stroke Width Transform and GrabCut.....	151
<i>Jay Bosamiya, Palash Agrawal, Partha Pratim Roy and Balasubramanian Raman</i>	
Local Feature Reliability Measure Using Multiview Synthetic Images for Mobile Visual Search.....	156
<i>Kohei Matsuzaki, Yusuke Uchida, Shigeyuki Sakazawa and Shin'ichi Satoh</i>	
Online Handwritten Cursive Word Recognition Using Segmentation-free and Segmentation-based Methods.....	161
<i>Bilan Zhu, Arti Shivram, Venu Govindaraju and Masaki Nakagawa</i>	
Spatiotemporal Auto-Correlation of Grayscale Gradient with Importance Map for Cooking Gesture Recognition.....	166
<i>Wataru Ohyama, Soichiro Hotta and Tetsushi Wakabayashi</i>	
An Incremental Recognition Method for Online Handwritten Mathematical Expressions.....	171
<i>Khanh Phan, Cuong Tuan Nguyen, Anh Le and Masaki Nakagawa</i>	
An Improved Segmentation of Online English Handwritten Text using Recurrent Neural Networks.....	176
<i>Cuong Tuan Nguyen and Masaki Nakagawa</i>	
Improved Shape Code Based Word Matching For Multi-script Documents.....	181
<i>Tanmoy Mondal, Arundhuti Tarafdar, Jean-Yves Ramel, Nicolas Ragot and Umapada Pal</i>	
Generating Unsupervised Models for Online Long-Term Daily Living Activity Recognition.....	186
<i>Farhood Negin, Serhan Cosar, Michal Koperski and Francois Bremond</i>	
Transposed Discriminative Low-Rank Representation for Face Recognition.....	191
<i>Hoangvu Nguyen, Wankou Yang and Changyin Sun</i>	
Augmented Text Character Proposals and Convolutional Neural Networks for Text Spotting from Scene Images.....	196
<i>Alessandro Zamberletti, Ignazio Gallo and Lucia Noce</i>	

Float Greedy-search-based Subspace Clustering.....	201
<i>Lingxiao Song, Man Zhang, Qi Li, Ran He and Zhenan Sun</i>	
High Order Graphlets for Pattern Classification.....	206
<i>Anjan Dutta and Hichem Sahbi</i>	
Towards Parameter-less Support Vector Machines.....	211
<i>Jakub Nalepa, Krzysztof Siminski and Michal Kawulok</i>	
Uniform Low-Rank Representation for Unsupervised Visual Domain Adaptation.....	216
<i>Pengcheng Liu, Peipei Yang, Kaiqi Huang and Tieniu Tan</i>	
A Novel Feature Reduction Framework for Digital Mammogram Image Classification.....	221
<i>Hajar Alharbi, Gregory Falzon and Paul Kwan</i>	
A Bottom-Up Dictionary Learning based Classification for Face Recognition.....	226
<i>Heyou Chang, Meng Yang and Jian Yang</i>	
Character-Position-Free On-line Handwritten Japanese Text Recognition.....	231
<i>Jianjuan Liang, Bilan Zhu, Taro Kumagai and Masaki Nakagawa</i>	
Bayesian Nonparametric Inference of Latent Topic Hierarchies for Multimodal Data.....	236
<i>Takuji Shimamawari, Koji Eguchi and Atsuhiro Takasu</i>	
Lung Segmentation with Improved Graph Cuts on Chest CT Images.....	241
<i>Shuangfeng Dai, Ke Lu and Jiyang Dong</i>	
Aero-thermal Radiation Correction via Multi-scale Bias Field Estimation.....	246
<i>Lerenhan Li, Luxin Yan, Nong Sang, Changxin Gao and Jing Hu</i>	
Text Line Extraction of Curved Document Images using Hybrid Metric.....	251
<i>Zuming Huang, Jie Gu, Gaofeng Meng and Chunhong Pan</i>	
Fast Interactive Segmentation in Stereo Images Based on Multi-scale Graph.....	256
<i>Wei Ma, Xiaohui Qiu, Luwei Yang, Shuo Liu and Lijuan Duan</i>	
My Camera Can See Through Fences: A Deep Learning Approach for Image De-fencing.....	261
<i>Sankaraganesh Jonna, Krishna Nakka and Rajiv Sahay</i>	
Unveiling Contrast Within Darkness.....	266
<i>Yuen Peng Loh and Chee Seng Chan</i>	
Robust Feature Matching via Multiple Descriptor Fusion.....	271
<i>Ting Hu and Yen-Yu Lin</i>	

## **Oral Session 3: Machine Learning**

Distributed Forests for MapReduce-based Machine Learning.....	276
<i>Ryoji Wakayama, Ryuei Murata, Akisato Kimura, Takayoshi Yamashita, Yuji Yamauchi and Hironobu Fujiyoshi</i>	
Supervised Topology Preserving Hashing.....	281
<i>Shu Zhang, Man Zhang, Qi Li, Tieniu Tan and Ran He</i>	
Laplacian Pyramids for Deep Feature Inversion.....	286
<i>Aniket Singh and Anoop Namboodiri</i>	

## **Oral Session 4: Image Processing**

Efficient Cepstrum Analysis based UNLM PSF Estimation in Single Blurred Image.....	291
<i>Yuta Shimamoto, Qian Chen, Xiang Ruan and Haiyuan Wu</i>	
Single-Image Super-Resolution using Clustering-Based Global Regression and Propagation Filtering....	296
<i>Wenming Yang, Yapeng Tian, Fei Zhou, Tingrong Yuan, Xuesen Shang and Qingmin Liao</i>	
Temporally Coherent Disparity Maps using CRFs with Fast 4D Filtering.....	301
<i>Siavash Arjomand Bigdely, Matthias Zwicker and Gregor Budweiser</i>	
A Learned Overcomplete Sparseness and IGMRF Based Regularization Framework For Dense Disparity Estimation.....	306
<i>Sonam Nahar and Manjunath Joshi</i>	

## **Poster Session 2**

Steerable Second Order Intensity Features for Pedestrian Detection.....	311
<i>Sing Kuang Tan, Tat-Jen Cham and Jianxin Wu</i>	
Linear Multimodal Fusion in Video Concept Analysis Based on Node Equilibrium Model.....	316
<i>Jie Geng, Zhenjiang Miao, Qinghua Liang and Shu Wang</i>	
Multi-Cut Light Field Depth Estimation.....	321
<i>Thoma Papadimitri and Onay Urfalioglu</i>	
Privacy-conscious Human Detection Using Low-resolution Video.....	326
<i>Nobuhiro Miyazaki, Kentaro Tsuji, Mingxie Zheng, Moyuri Nakashima, Yuji Matsuda and Eigo Segawa</i>	
Visual Tracking via Multi-experts Combined with Average Hash Model.....	331
<i>Yachun Feng, Hong Zhang, Hao Chen, Helong Wang and Ding Yuan</i>	
Action Recognition Using Completed Local Binary Patterns and Multiple-class Boosting Classifier.....	336
<i>Yun Yang, Baochang Zhang, Linlin Yang, Chen Chen and Wankou Yang</i>	
Event Detection in Soccer Videos using Shot Focus Identification.....	341
<i>Wei Zhao, Yao Lu, Haohao Jiang and Wei Huang</i>	
Segmentation of 3D Image of a Rock Sample Supervised by 2D Mineralogical Image.....	346
<i>Igor Varfolomeev, Ivan Yakimchuk and Boris Sharchilev</i>	
Discriminant Statistical Analysis of Local Facial Geometrical Regions.....	351
<i>Misae Nakatsu, Xian-Hua Han, Ryosuke Kimura and Yen-Wei Chen</i>	
Supervised Spectral Subspace Clustering for Visual Dictionary Creation in the Context of Image Classification.....	356
<i>Imtiaz Ziko, Elisa Fromont, Damien Muselet and Marc Sebban</i>	
Appearance-based Multiple Fish Tracking for Collective Motion Analysis.....	361
<i>Kei Terayama, Koki Hongo, Hitoshi Habe and Masa-aki Sakagami</i>	
Efficient Multiclass Object Detection: Detecting Pedestrians and Bicyclists in a Truck's Blind Spot Camera.....	366
<i>Kristof Van Beeck and Toon Goedemé</i>	
Camera and Lidar Fusion for Pedestrian Detection.....	371
<i>Wang Jun and Tao Wu</i>	

Mixture Model based Color Clustering for Psoriatic Plaque Segmentation.....	376
<i>Anabik Pal, Anandarup Roy, Kushal Sen, Raghunath Chatterjee, Utpal Garain and Swapna Senapati</i>	
Specific Changes Detection in Visible-Band VHR Images using Classification Likelihood Space.....	381
<i>Feimo Li, Shuxiao Li, Chengfei Zhu, Xiaosong Lan and Hongxing Chang</i>	
Automated Prognosis Analysis for Traumatic Brain Injury CT Images.....	386
<i>Tianxia Gong, Bolan Su, Abhinit Ambastha, Chew Lim Tan and Tchoyoson Lim</i>	
New Texture-Spatial Features for Keyword Spotting in Video Images.....	391
<i>Palaiahnakote Shivakumara, Guozhu Liang, Sangheeta Roy, Umapada Pal and Tong Lu</i>	
Sketch-based Image Retrieval using Sketch Tokens.....	396
<i>Shu Wang and Zhenjiang Miao</i>	
Binary Matching for High-dimensional Image Descriptors.....	401
<i>Hongjun Wang, Jianji Hu and Weihong Deng</i>	
HEp-2 Cells Staining Patterns Classification via Wavelet Scattering Network and Random Forest.....	406
<i>Hongwei Li, Jianguo Zhang and Wei-Shi Zheng</i>	
Latent Factor Model Based Classification for Detecting Abnormalities in Retinal Images.....	411
<i>Tabish Syed and Jayanthi Sivaswamy</i>	
Writer Identification using Edge based Features.....	416
<i>Zhenyin Fan, Zhenhua Guo and Youbin Chen</i>	
Fine-Grain Annotation of Cricket Videos.....	421
<i>Rahul Sharma, Pramod Sankar K., and Jawahar C.V.</i>	
Handwritten Word Spotting in Indic Scripts using Foreground and Background Information.....	426
<i>Ayan Das, Ayan Kumar Bhunia, Partha Pratim Roy and Umapada Pal</i>	
Steerable Riesz Wavelet based Approach for Iris Recognition.....	431
<i>Shekar B H and Sharada Bhat</i>	
Similarity Learning Based on Pool-Based Active Learning for Manga Character Retrieval.....	437
<i>Motoi Iwata, Eiki Imazu and Koichi Kise</i>	
Real-time Fingertip Detection based on Depth Data.....	443
<i>Chaoyu Liang, Yonghong Song and Yuanlin Zhang</i>	
Estimation of Browsing States in Consumer Decision Processes from Eye Movements.....	448
<i>Erina Schaffer, Hiroaki Kawashima and Takashi Matsuyama</i>	
Hyperspectral Image Classification Using Gradient Local Auto-Correlations.....	454
<i>Chen Chen, Junjun Jiang, Baochang Zhang, Wankou Yang and Jianzhong Guo</i>	
Deep Learning using Heterogeneous Feature Maps for Mahout Networks.....	459
<i>Yasunori Ishii, Reiko Hagawa and Sotaro Tsukizawa</i>	
Towards Robust SVM Training from Weakly Labeled Large Data Sets.....	464
<i>Michał Kawulok and Jakub Nalepa</i>	
A Novel Local Success Weighted Ensemble Classifier.....	469
<i>Raghvendra Kannao and Prithwijit Guha</i>	
1000fps Human Segmentation with Deep Convolutional Neural Networks.....	474
<i>Chunfeng Song, Yongzhen Huang, Zhenyu Wang and Liang Wang</i>	

How to Initialize the CNN for small datasets: Extracting Discriminative Filters from Pre-trained Model.....	479
<i>Guanwen Zhang, Jien Kato, Yu Wang and Kenji Mase</i>	
A New Shape Descriptor Based on an Angular-Linear Probability Distribution.....	484
<i>Kazunori Iwata, Nobu Suematsu and Akira Hayashi</i>	
Low-Bit Representation of Linear Classifier Weights for Mobile Large-Scale Image Classification.....	489
<i>Yoshiyuki Kawano and Keiji Yanai</i>	
Occlusion-Robust Model Learning for Human Pose Estimation.....	494
<i>Yuki Kawana and Norimichi Ukita</i>	
Natural Human Gestures Classification using Multisensor Data.....	499
<i>Michał Cholewa and Przemysław Głomb</i>	
An Automatic Yearbook Style Photo Generation Method using Color Grading and Guide Image Filtering based Facial Skin Color Correction.....	504
<i>Tatsuya Baba, Keiichiro Shirai, Masahiro Okuda, Yusuke Tatesumi and Paul Perrotin</i>	
CRF with Locality-Consistent Dictionary Learning for Semantic Segmentation.....	509
<i>Yi Li, Yanqing Guo, Jun Guo, Ming Li and Xiangwei Kong</i>	
Skeleton-based Audio Envelope Shape Analysis.....	514
<i>Cong Yang, Oliver Tiebe, Marcin Grzegorzek and Ewa Lukasik</i>	
Robust Road Lane Detection using Extremal-Region Enhancement.....	519
<i>Jingchen Gu, Qieshi Zhang and Sei-ichiro Kamata</i>	
A novel Fuzzy LBP based Symbolic Representation Technique for Classification of Medicinal Plants.....	524
<i>Naresh Y G and Nagendraswamy H.S</i>	
Accent Classification with Phonetic Vowel Representation.....	529
<i>Zhenhao Ge, Yingyi Tan and Aravind Ganapathiraju</i>	

## **Oral Session 5: Media Processing**

Facial Smile Detection Based on Deep Learning Features.....	534
<i>Kaihao Zhang, Yongzhen Huang, Hong Wu and Liang Wang</i>	
Segmentation and Recognition of Text written in 3D using Leap Motion Interface.....	539
<i>Chelsi Agrawal, Debi Prosad Dogra, Rajkumar Saini and Partha Pratim Roy</i>	
A New Sharpness based Approach for Character Segmentation in License Plate Images.....	544
<i>Vijeta Khare, Palaiahnakote Shivakumara, Raveendran Paramesran, Kim Meng Liang and Hon Hock Woon</i>	
A Study on Improvement of Airway Segmentation using Hybrid Method.....	549
<i>Qier Meng, Takayuki Kitasaka, Yukitaka Nimura, Masahiro Oda and Kensaku Mori</i>	
Nuclear Detection in 4D Microscope Images of Developing Embryo Using Enhanced Probability Map of Top-ranked Intensity-ordered Descriptors.....	554
<i>Xian-Hua Han, Yukako Tohsato, Koji Kyoda, Shuichi Onami, Ikuko Nishikawa, Yen-Wei Chen</i>	

## **Oral Session 6: Clustering**

Adaptive Multi-view Clustering via Cross Trace Lasso.....	559
<i>Dong Wang, Ran He, Liang Wang and Tieniu Tan</i>	

Global and Local Consistent Multi-view Subspace Clustering.....	564
<i>Yanbo Fan, Ran He and Baogang Hu</i>	
Multi-Resolution Binary Shape Tree for Efficient 2D Clustering.....	569
<i>Csaba Beleznai, Andreas Zweng, Thomas Netousek and Josef Alois Birchbauer</i>	

## **Oral Session 7: Action Recognition, Detection and Tracking**

Hierarchical Motion Evolution for Action Recognition.....	574
<i>Hongsong Wang, Wei Wang and Liang Wang</i>	
Skeleton Based Action Recognition with Convolutional Neural Network.....	579
<i>Yong Du, Yun Fu and Liang Wang</i>	
Reduce False Positives for Human Detection by a Priori Probability in Videos.....	584
<i>Lei Wang, Xu Zhao and Yuncai Liu</i>	
Multilayer Feature Combination for Visual Tracking.....	589
<i>Heng Fan, Jinhai Xiang and Fuchuan Ni</i>	

## **Oral Session 8: Image Retrieval and Recognition**

Efficient Graph Spanning Structures for Large Database Image Retrieval.....	594
<i>Bogdan Mocanu, Ruxandra Tapu and Titus Zaharia</i>	
Learning Clustered Subspaces for Sketch-based Image Retrieval.....	599
<i>Koustav Ghosal, Ameya Prabhu, Riddhiman Dasgupta and Anoop Namboodiri</i>	
Multi-Pruning of Decision Trees for Knowledge Representation and Classification.....	604
<i>Mohammad Azad, Igor Chikalov, Shahid Hussain and Mikhail Moshkov</i>	

## **Poster Session 3**

Trajectory-based Stereo Visual Odometry with Statistical Outlier Rejection.....	609
<i>JiYuan Zhang, Rui Gan, Gang Zeng, Falong Shen and Hongbin Zha</i>	
Multiple-dataset Traffic Sign Classification with OneCNN.....	614
<i>Fran Jurišić, Ivan Filković and Zoran Kalafatić</i>	
Mid-Level Parts Mined By Feature Selection For Action Recognition.....	619
<i>Shiwei Zhang, Nong Sang, Changxin Gao, Feifei Chen and Jing Hu</i>	
Semi-Global Depth from Focus.....	624
<i>Wentao Liu and Xihong Wu</i>	
Fine Pose Estimation of Known Objects in Cluttered Scene Images.....	630
<i>Sudipto Banerjee, Sanchit Aggarwal and Anoop Namboodiri</i>	
A Real-time LIDAR and Vision based Pedestrian Detection System for Unmanned Ground Vehicles.....	635
<i>Xiaofeng Han, Jianfeng Lu, Ying Tai and Chunxia Zhao</i>	
Hough-based Action Detection with Time-warped Voting.....	640
<i>Kensho Hara and Kenji Mase</i>	
Stereoscopic Image Warping for Enhancing Composition Aesthetics.....	645
<i>Md Baharul Islam, Lai Kuan Wong, Chee Onn Wong and Kok-Lim Low</i>	

Robust Object Recognition in Wearable Eye Tracking System.....	650
<i>Mustafa Shdaifat, Andreas Dengel, Syed Bukhari and Takumi Toyama</i>	
Classification of Heart Sounds using Discrete and Continuous Wavelet Transform and Random Forests.....	655
<i>Prospero Jr. Naval, Christine Balili and Caryssa Sobrepeña</i>	
Human action recognition in the fractional Fourier domain.....	660
<i>Jia-xin Cai and Guocan Feng</i>	
Automatic Apex Frame Spotting in Micro-expression Database.....	665
<i>Sze Teng Liang, John See, KokSheik Wong, Anh Cat Le Ngo, Yee Hui Oh and Raphael Phan</i>	
Face Recognition with Occlusion.....	670
<i>Yingcheng Su, Zhenhua Guo, Yujiu Yang and Wei-Guo Yang</i>	
Video Text Detection with Text Edges and Convolutional Neural Network.....	675
<i>Ping Hu, Weiqiang Wang and Ke Lu</i>	
Overwriting Repetition and Crossing-out Detection in Online Handwritten Text.....	680
<i>Nilanjana Bhattacharya, Volkmar Frinken, Umapada Pal and Partha Pratim Roy</i>	
Gaze Classification on a Mobile Device by using Deep Belief Networks.....	685
<i>Hyunsung Park and Daijin Kim</i>	
Text Detection in Born-Digital Images by Mass Estimation.....	690
<i>Jiamin Xu, Palaiahnakote Shivakumara, Tong Lu, Chew Lim Tan and Michael Blumenstein</i>	
Beyond Human Recognition: A CNN-Based Framework for Handwritten Character Recognition.....	695
<i>Li Chen, Song Wang, Wei Fan, Jun Sun and Naoi Satoshi</i>	
Character Recognition of Medieval English Manuscripts supported by a Word Frequency Table.....	700
<i>Kei Tanaka and Kengo Terasawa</i>	
Retrieval of Scene Image and Video Frames using Date Field Spotting.....	705
<i>Partha Pratim Roy, Ayan Das, Dipak Majhi and Umapada Pal</i>	
Object Verification in Two Different Views using Sparse Representation.....	710
<i>Shih-Chung Hsu and Chung-Ling Huang</i>	
Neural Network Based Over-Segmentation for Scene Text Recognition.....	715
<i>Xin He, Yichao Wu, Kai Chen, Fei Yin and Cheng-Lin Liu</i>	
Offline Handwritten Devanagari Word Recognition: Information Fusion at Feature and Classifier Levels.....	720
<i>Bikash Shaw, Ujjwal Bhattacharya and Swapan Parui</i>	
Non-Semantic Facial Parts for Face Verification.....	725
<i>Chong Cao and Haizhou Ai</i>	
Very Deep Convolutional Neural Network Based Image Classification Using Small Training Sample Size.....	730
<i>Shuying Liu and Weihong Deng</i>	
DASA: Domain Adaptation in Stacked Autoencoders using Systematic Dropout.....	735
<i>Abhijit Guha Roy and Debdoott Sheet</i>	

Locality-constrained Group Sparse Coding Regularized NMR for Robust Face Recognition.....	740
<i>Hengmin Zhang, Wei Luo, Jian Yang and Lei Luo</i>	
Detector Ensemble based on False Positive Mining for Pedestrian Detection.....	745
<i>Yuki Suzuki, Daisuke Deguchi, Yasutomo Kawanishi, Ichiro Ide and Hiroshi Murase</i>	
Image Set Representation and Classification with Covariate-relation Graph.....	750
<i>Zhuqiang Chen, Bo Jiang, Jin Tang and Bin Luo</i>	
Explicit Foreground and Background Modeling in The Classification of Text Blocks in Scene Images.....	755
<i>Bowornrat Sriman and Lambert Schomaker</i>	
Transfer Forest Based on Covariate Shift.....	760
<i>Hironobu Fujiyoshi, Takayoshi Yamashita, Yuji Yamauchi and Masamitsu Tsuchiya</i>	
Stacked Partial Least Squares Regression for Image Classification.....	765
<i>Ryoma Hasegawa and Kazuhiro Hotta</i>	
Sparse Autoencoder based Spatial Pyramid Facial Feature Learning.....	770
<i>Xiao Ma and Jufu Feng</i>	
Age-invariant Face Recognition using a Feature Progressing Model.....	775
<i>Junyoung Si and Weiping Li</i>	
Haze Removal based on Sparse Representation Prior.....	781
<i>Jiafeng Li, Hong Zhang, Hao Chen, Yifan Yang and Mingui Sun</i>	
On Coupled Regularization for Non-Convex Variational Image Enhancement.....	786
<i>Freddie Astrom and Christoph Schnoerr</i>	
Feature Extraction with Convolutional Restricted Boltzmann Machine for Audio Classification.....	791
<i>Min Li, Zhenjiang Miao and Cong Ma</i>	
Blind Image Quality Assessment via A Two-Stage Non-Parametric Framework.....	796
<i>Redzuan Abdul Manap, Ling Shao and Alejandro Frangi</i>	
Efficient objectness via saliency seeds and contour segments.....	801
<i>Rigen Te and Cheng Yan</i>	
Noise-resistant local binary pattern based on random projection.....	806
<i>Shasha Li, Yukai Tu, Weihong Deng and Jiwen Lu</i>	

## **Oral Session 9: Features**

A Person Authentication System Using Second Minor Finger Knuckles for Door Handle.....	811
<i>Daichi Kusanagi, Shoichiro Aoyama, Koichi Ito and Takafumi Aoki</i>	
Iris Biometric: Is the Near-Infrared Spectrum always the Best?.....	816
<i>Mohammed Abdullah, Jonathon Chambers, Wai Woo and Satnam Dlay</i>	
Co-occurrence Context of the data-driven Quantized Local Ternary Patterns for Visual Recognition.....	820
<i>Xian-Hua Han, Yen-Wei Chen and Gang Xu</i>	
<b>Author Index.....</b>	<b>825</b>