

# **2017 4th IAPR Asian Conference on Pattern Recognition (ACPR 2017)**

**Nanjing, China  
26-29 November 2017**

**Pages 1-476**



**IEEE Catalog Number: CFP1789N-POD  
ISBN: 978-1-5386-3355-7**

**Copyright © 2017 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 is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.***

IEEE Catalog Number:	CFP1789N-POD
ISBN (Print-On-Demand):	978-1-5386-3355-7
ISBN (Online):	978-1-5386-3354-0
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)

CURRAN ASSOCIATES INC.  
**proceedings**  
.com

# The 4th Asian Conference on Pattern Recognition

## ACPR 2017

### Table of Contents

<b>Message from General and Program Chairs</b> .....	xvi
<b>Conference Organization</b> .....	xvii
<b>Program Committee</b> .....	xviii

---

#### Computer Vision and Robot Vision

Re-ranking Person Re-identification with Local Discriminative Information .....	1
<i>Kezhou Chen, Nong Sang, Zhiqiang Li, Changxin Gao, and Ruolin Wang</i>	
Recent Progress of Face Image Synthesis .....	7
<i>Zhihe Lu, Zhihang Li, Jie Cao, Ran He, and Zhenan Sun</i>	
CNN-Based Pedestrian Orientation Estimation from a Single Image .....	13
<i>Koji Kumamoto and Keiichi Yamada</i>	
Compressing YOLO Network by Compressive Sensing .....	19
<i>Yirui Wu, Zhouyu Meng, Shivakumara Palaiahnakote, and Tong Lu</i>	
Improving Spatial Context in CNNs for Semantic Medical Image Segmentation .....	25
<i>Russel Mesbah, Brendan McCane, Steven Mills, and Anthony Robins</i>	
Change Detection with Global Viewpoint Localization .....	31
<i>Murase Tomoya, Tanaka Kanji, and Takayama Akitaka</i>	
Conic Fitting: New Easy Geometric Method and Revisiting Sampson Distance .....	37
<i>Yihong Wu, Haoren Wang, and Fulin Tang</i>	
Reading Text in Natural Scene Images via Deep Neural Networks .....	43
<i>Haifeng Zhao, Yong Hu, and Jinxia Zhang</i>	
Split and Merge for Accurate Plane Segmentation in RGB-D Images .....	49
<i>Yigong Zhang, Tao Lu, Jian Yang, and Hui Kong</i>	
Learning Principal Orientations Descriptor for Action Recognition .....	55
<i>Lei Chen, Jiwen Lu, Zhanjie Song, and Jie Zhou</i>	
Classification of Depressive Disorder Based on RS-fMRI Using Multivariate Pattern Analysis with Multiple Features .....	61
<i>Lishu Gu, Linlin Huang, Fei Yin, and Yuqi Cheng</i>	

CNet: Context-Aware Network for Semantic Segmentation .....	67
<i>Rongliang Cheng, Junge Zhang, Peipei Yang, Kangwei Liu, and Shujun Zhang</i>	
Fabric Defect Detection Based on Gabor Filter and Tensor Low-Rank Recovery .....	73
<i>Guangshuai Gao, Chaodie Liu, Zhoufeng Liu, Chunlei Li, and Ruimin Yang</i>	
Object Tracking by Branched Correlation Filters and Particle Filter .....	79
<i>Hitoshi Nishimura, Yuki Nagai, Kazuyuki Tasaka, and Hiromasa Yanagihara</i>	
Probability Based Voting for Vanishing Point Detection .....	85
<i>Qian Chen, Kouki Masumoto, Haiyuan Wu, and Shihong Lao</i>	
Rapid Object Detection in VHR Optical Remote Sensing Images Based on Rotation-Invariant Discrete Hashing .....	91
<i>Hui Xu, Yazhou Liu, and Quansen Sun</i>	
Attention-Set Based Metric Learning for Video Face Recognition .....	97
<i>Yibo Hu, Xiang Wu, and Ran He</i>	
Sharpness and Contrast Based Features for Word-Wise Video Type Classification .....	103
<i>K. S. Raghunandan, Palaiahnakote Shivakumara, G. Hemantha Kumar, Umapada Pal, and Tong Lu</i>	
Privacy-Conscious Person Re-identification Using Low-Resolution Videos .....	109
<i>Mingxie Zheng, Kentaro Tsuji, Nobuhiro Miyazaki, Yuji Matsuda, Takayuki Baba, Eigo Segawa, and Yusuke Uehara</i>	
Deep Feature Similarity for Generative Adversarial Networks .....	115
<i>Xianxu Hou, Ke Sun, and Guoping Qiu</i>	
Detection of Curvilinear Centerline by Using Hough Voting .....	120
<i>Hanjin Zhang, Yang Yang, and Hongbin Shen</i>	
Pixel-Based Color Model for Robust Tracking .....	126
<i>Yang Huo, Yuehuan Wang, Xiaoyun Yan, and Kaiheng Dai</i>	
Motion Vector Based Data Association for On-Line Multi-object Tracking .....	132
<i>Cong Ma, Zhenjiang Miao, Xiao-Ping Zhang, and Min Li</i>	
Multi-task Deep Learning for Fast Online Multiple Object Tracking .....	138
<i>Yuqi Zhang, Yongzhen Huang, and Liang Wang</i>	
Illumination-Invariant Feature by SVD and Its Applications .....	144
<i>Sainan Guo, Yicheng Gao, Yingna Su, and Hui Kong</i>	
Detection of Road Vanishing Point by Stereo Camera .....	150
<i>Tao Lu, Yigong Zhang, and Hui Kong</i>	
Oil Tank Detection via Target-Driven Learning Saliency Model .....	156
<i>Wendan Wang, Danpei Zhao, and Zhiguo Jiang</i>	
Text and Symbol Extraction in Traffic Panel from Natural Scene Images .....	162
<i>Zhen-Mao Li and Lin-Lin Huang</i>	
Estimating Relative Pose between Nonoverlapping Cameras by Four Laser Pointers Based on General Camera Model .....	168
<i>Shigang Li, Takahiro Harada, and Wuhe Zou</i>	

Coarse-to-Fine Age Progression Based on Conditional GANs .....	173
<i>Jiaxin Chen, Jianjun Qian, and Zhihui Lai</i>	
Deep Domain Adaptation with a Few Samples for Face Identification .....	178
<i>Fucheng You, Yue Cao, and Chenwei Zhang</i>	
Supervised Two-Step Hash Learning for Efficient Image Retrieval .....	184
<i>Xinhui Wu, Sei-ichiro Kamata, and Lizhuang Ma</i>	
Learning a Smart Convolutional Neural Network with High-Level Semantic Information .....	190
<i>Xinshu Qiao, Chunyan Xu, Jian Yang, and Jiatao Jiang</i>	
Occlusion Object Detection via Collaborative Sensing Deep Convolution Network .....	196
<i>Ce Li, Xinyu Zhao, Hao Liu, and Limei Xiao</i>	
Robust Lane Detection and Tracking with Propagated Spatio-temporal Constraints .....	202
<i>Tingting Li, Kunqian Li, and Wenbing Tao</i>	
Multi-view Stereo Combined with Space Propagation and Pixel-Level Refinement .....	208
<i>Wenjie Huang, Kun Sun, and Wenbing Tao</i>	
Subspace Clustering via Sparse Graph Regularization .....	214
<i>Qiang Zhang and Zhenjiang Miao</i>	
Image Distortion Detection Using Convolutional Neural Network .....	220
<i>Namhyuk Ahn, Byungkon Kang, and Kyung-Ah Sohn</i>	
Finding Compact Class Sets for Korean Font Image Classification .....	226
<i>Seungwon Shin, Dongkyu Kim, Homin Park, Byungkon Kang, and Kyung-Ah Sohn</i>	
Font Creation Using Class Discriminative Deep Convolutional Generative Adversarial Networks .....	232
<i>Kotaro Abe, Brian Kenji Iwana, Viktor Gosta Holmér, and Seiichi Uchida</i>	
Depth Estimation for Hazy Images Using Deep Learning .....	238
<i>Laksmita Rahadianti, Fumihiko Sakaue, and Jun Sato</i>	
Robust Multi-scale ORB Algorithm in Real-Time Monocular Visual Odometry .....	244
<i>Qiongjie Cui and Huajun Liu</i>	
Focal Stack Representation and Focus Manipulation .....	250
<i>Parikshit Sakurikar and P. J. Narayanan</i>	
Adversarial Learning Based Saliency Detection .....	256
<i>Xuecai Hu, Xin Zhao, Kaiqi Huang, and Tieniu Tan</i>	
Harnessing U-disparity in Point Clouds for Obstacle Detection .....	262
<i>Yang Wei, Chen Gong, and Shuo Chen</i>	
Irregular Convolutional Neural Networks .....	268
<i>Jiabin Ma, Wei Wang, and Liang Wang</i>	

Correlated Motion Based Crowd Analysis in Queueing Situations .....	274
<i>Csaba Beleznai, Andreas Zweng, and Daniel Steininger</i>	
Applying BinaryWeights in Neural Networks for Sequential Text Recognition .....	280
<i>Zi-Hao Wang, Chun Yang, and Xu-Cheng Yin</i>	
TRPN: A Text Region Proposal Network in the Wild under the Constraint of Low Memory GPU .....	286
<i>Prateek Keserwani, Tofik Ali, and Partha Pratim Roy</i>	
Predicting Segmentation "Easiness" from the Consistency for Weakly-Supervised Segmentation .....	292
<i>Wataru Shimoda and Keiji Yanai</i>	
Sequence-to-Sequence Learning for Human Pose Correction in Videos .....	298
<i>Sirnam Swetha, Vineeth N Balasubramanian, and C.V. Jawahar</i>	
From Classification to Regression: Model Transfer for Visual Aesthetic Quality Assessment .....	304
<i>Wenzhen Huang, Peipei Yang, and Kaiqi Huang</i>	
Reweighted Low Rank Representation Based on Fractional-Order Function .....	310
<i>Yiqiang Zhai and Zexuan Ji</i>	
Dynamic Vision Sensors for Human Activity Recognition .....	316
<i>Stefanie Anna Baby, Bimal Vinod, Chaitanya Chinni, and Kaushik Mitra</i>	
Words Speak for Actions: Using Text to Find Video Highlights .....	322
<i>Sukanya Kudi and Anoop M Namboodiri</i>	
Learning Light Field Reconstruction from a Single Coded Image .....	328
<i>Anil Kumar Vadathya, Saikiran Cholleti, Gautham Ramajayam, Vijayalakshmi Kanchana, and Kaushik Mitra</i>	
Fully Convolutional DenseNet for Saliency-Map Prediction .....	334
<i>Taiki Oyama and Takao Yamanaka</i>	
Improving Small Object Detection .....	340
<i>Harish Krishna and C.V. Jawahar</i>	
Pedestrian Detection with Multi-scale Context-Embedded Feature Learning .....	346
<i>Hao Cheng, Chong-Yang Zhang, Wenjuan Song, Yan Li, and You-ping Zhong</i>	
Compressing Deep Neural Networks for Recognizing Places .....	352
<i>Soham Saha, Girish Varma, and C.V. Jawahar</i>	
Age-Invariant Person Identification by Segmentation Verification of Face Image .....	358
<i>Yuta Somada, Wataru Ohyama, and Tetsushi Wakabayashi</i>	
Person Re-identification by Saliency-Weighted Descriptor and Ranking Aggregation .....	364
<i>Chao Guan, Minxian Li, and Chunxia Zhao</i>	

# Pattern Recognition and Machine Learning

PCA-LDANet: A Simple Feature Learning Method for Image Classification .....	370
<i>Yukun Ge, Jiani Hu, and Weihong Deng</i>	
A Generalized Discriminative Least Squares Regression Model .....	376
<i>Haoliang Yuan, Junjie Zheng, Fangyuan Xu, Loi Lei Lai, Weiyang Li, Houqing Zheng, and Zhimin Wang</i>	
GM-Net: Learning Features with more Efficiency .....	382
<i>Yujia Chen and Ce Li</i>	
Enlarging Effective Receptive Field of Convolutional Neural Networks for Better Semantic Segmentation .....	388
<i>Yifan Gu, Zuofeng Zhong, Shuai Wu, and Yong Xu</i>	
Robust Principal Component Analysis Based on L1-2 Metric .....	394
<i>Fanlong Zhang, Zhangjing Yang, Minghua Wan, and Guowei Yang</i>	
Real-Time Traffic Sign Classification Using Combined Convolutional Neural Networks .....	399
<i>Lingying Chen, Guanghui Zhao, Junwei Zhou, and Li Kuang</i>	
Efficient Speaker Naming via Deep Audio-Face Fusion and End-to-End Attention Model .....	405
<i>Xin Liu, Jiajia Geng, and Haibin Ling</i>	
An Enhanced Density Peak Based Clustering Algorithm .....	411
<i>Jian Hou and Weixue Liu</i>	
KL Divergence Based Person Re-identification Using Multivariate Gaussian Distributions .....	417
<i>Hongyuan Wang, Zongyuan Ding, Tongguang Ni, and Fuhua Chen</i>	
An Integrated LSTM Prediction Method Based on Multi-scale Trajectory Space .....	423
<i>Ming He, Gongda Qiu, Jian Shen, Yuting Cao, and Chamath Dilshan Gunasekara</i>	
Travel Time-Dependent Maximum Entropy Inverse Reinforcement Learning for Seabird Trajectory Prediction .....	430
<i>Tsubasa Hirakawa, Takayoshi Yamashita, Ken Yoda, Toru Tamaki, and Hironobu Fujiyoshi</i>	
Efficient and Robust TWSVM Classifier Based on L1-Norm Distance Metric for Pattern Classification .....	436
<i>He Yan, Qiao-Lin Ye, Tian-An Zhang, and Dong-Jun Yu</i>	
Local Behavior Analysis for Trajectory Classification Using Graph Embedding .....	442
<i>Rajkumar Saini, Pradeep Kumar, Saikat Dutta, Partha Pratim Roy, and Umapada Pal</i>	
Path Following with Supervised Deep Reinforcement Learning .....	448
<i>Wen-Yi Gu, Xin Xu, and Jian Yang</i>	

Gait Analysis Using Shadow Motion .....	453
<i>Pradeep Kumar, Rajkumar Saini, Chaitanya Sai Tumma, Partha Pratim Roy, and Debi Prosad Dogra</i>	
Impact of Ageing on EEG Based Biometric Systems .....	459
<i>Barjinder Kaur, Pradeep Kumar, Partha Pratim Roy, and Dinesh Singh</i>	
Fabric Defect Detection Algorithm Based on Convolution Neural Network and Low-Rank Representation .....	465
<i>Zhoufeng Liu, Baorui Wang, Chunlei Li, Bicao Li, and Xianghui Liu</i>	
Deep Face Recognition under Eyeglass and Scale Variation Using Extended Siamese Network .....	471
<i>Fan Qiu, Sei-ichiro Kamata, and Lizhuang Ma</i>	
Robust Jointly Sparse Regression for Image Feature Selection .....	477
<i>Dongmei Mo and Zhihui Lai</i>	
Global Abnormal Event Detection Based on Compact Coefficient Low-Rank Dictionary Learning .....	483
<i>Ang Li, Zhenjiang Miao, and Yigang Cen</i>	
Facial Expression Intensity Estimation Based on CNN Features and RankBoost .....	488
<i>Yue Ren, Jiani Hu, and Weihong Deng</i>	
Online Optimization and Feedback Elman Neural Network for Maneuvering Target Tracking .....	494
<i>Liwei Xia, Ya Zhang, and Huajun Liu</i>	
Multi-view Intact Space Clustering .....	500
<i>Ling Ling, Hong-Yang Chao, and Chang-Dong Wang</i>	
Style Transfer for Anime Sketches with Enhanced Residual U-net and Auxiliary Classifier GAN .....	506
<i>Lvmin Zhang, Yi Ji, Xin Lin, and Chunping Liu</i>	
Combining Enhanced Competitive Code with Compacted ST for 3D Palmprint Recognition .....	512
<i>Lunke Fei, Shaohua Teng, Jigang Wu, Yong Xu, Jie Wen, and Chunwei Tian</i>	
Coherent Low-tubal-Rank Tensor Completion .....	518
<i>Andong Wang, Zhong Jin, and Xiangrui Li</i>	
Statistical Performance of Convex Low-Rank and Sparse Tensor Recovery .....	524
<i>Xiangrui Li, Andong Wang, Jianfeng Lu, and Zhenmin Tang</i>	
Target Code Guided Binary Hashing Representations with Deep Neural Network .....	530
<i>Yunbo Wang, Dong Cao, and Zhenan Sun</i>	
Dual Learning of the Generator and Recognizer for Chinese Characters .....	536
<i>Yixing Zhu, Jun Du, and Jianshu Zhang</i>	
Radical Region Based CNN for Offline Handwritten Chinese Character Recognition .....	542
<i>Luo Weike and Kamata Sei-ichiro</i>	

A Feature Selection Algorithm Based on Pairwise Constraints for Linked Social Media Data .....	548
<i>Hong Zhang, Guyu Hu, Zhisong Pan, and Haimin Yang</i>	
Locality-Constrained Structural Orthogonal Procrustes Regression for Low-Resolution Face Recognition with Pose Variations .....	554
<i>Guangwei Gao, Pu Huang, Dong Yue, and Wankou Yang</i>	
Marginal Deep Architectures .....	559
<i>Guoqiang Zhong, Hongxu Wei, Yuchen Zheng, and Junyu Dong</i>	
Deep Rank Learning for Facial Attractiveness .....	565
<i>Yanbing Liao and Weihong Deng</i>	
3D Human Action Recognition with Skeleton Orientation Vectors and Stacked Residual Bi-LSTM .....	571
<i>Xiaoyi Wan, Tengfei Xing, Yi Ji, Shengrong Gong, and Chunping Liu</i>	
General-to-Specialized Analysis Based on Deep Belief Network .....	577
<i>Renjie Hu, Lianghua He, Yuqin Wang, and Hu D</i>	
Discriminative Transfer Learning Siamese CNN for Person Re-identification .....	583
<i>Yuan Tian, Cairong Zhao, Kang Chen, Yipeng Chen, Zhihua Wei, and Duoqian Miao</i>	
Image Inpainting: A Contextual Consistent and Deep Generative Adversarial Training Approach .....	588
<i>Xiaoyi Qin, Weifu Chen, Qi Shen, Jianmin Jiang, and Guocan Feng</i>	
Enhanced Adaptive Locality Preserving Projections for Face Recognition .....	594
<i>Jun Fan, Qiaolin Ye, and Ning Ye</i>	
Deep Learning-Based Classification of Protein Subcellular Localization from Immunohistochemistry Images .....	599
<i>Jin-Xian Hu, Ying-Ying Xu, Yang-Yang, and Hong-Bin Shen</i>	
Learning Autoencoder of Attribute Constraint for Zero-Shot Classification .....	605
<i>Kun Wang, Songsong Wu, Guangwei Gao, Quan Zhou, and Xiao-Yuan Jing</i>	
Facial Age Estimation via Label-Sensitive Supervised Neighborhood-Based Fisher Discriminant Analysis and Two-Steps Local Regression .....	611
<i>Xu Xiaoling and Jin Zhong</i>	
P-Order L2-Norm Distance Twin Support Vector Machine .....	617
<i>Xu Ma, Yingan Liu, and Qiaolin Ye</i>	
Learning Sparse Adversarial Dictionaries for Multi-class Audio Classification .....	623
<i>Vaisakh Shaj and Puranjoy Bhattacharya</i>	
Multi-feature Joint Dictionary Learning for Face Recognition .....	629
<i>Meng Yang, Qiangchang Wang, Wei Wen, and Zhihui Lai</i>	
Extending the Full Procrustes Distance to Anisotropic Scale in Shape Analysis .....	634
<i>Tsukasa Okamoto, Kazunori Iwata, and Nobuo Suematsu</i>	

Historical Image Annotation by Exploring the Tag Relevance .....	640
<i>Junjie Zhang, Jian Zhang, Qi Wu, Qiang Wu, Jinsong Xu, Jianfeng Lu, Robin Phua, Kate Curr, and Zhenmin Tang</i>	
Estimating Food Calories for Multiple-Dish Food Photos .....	646
<i>Takumi Ege and Keiji Yanai</i>	
Plagiarism Detection in Programming Assignments Using Deep Features .....	652
<i>Jitendra Yasaswi, Suresh Purini, and C.V. Jawahar</i>	
A Graph-Based Multi-kernel Feature Weight Learning Framework for Detection and Grading of Prostate Lesions Using Multi-parametric MR Images .....	658
<i>Weifu Chen, Bernard Chiu, Eli Gibson, Matthew Bastian-Jordan, Derek Cool, Zahra Kassam, Huagen Liang, Aaron Ward, Qi Shen, and Guocan Feng</i>	
Deep Neural Networks for Accurate Iris Recognition .....	664
<i>Yuzheng Xu, Tzu-Chan Chuang, and Shang-Hong Lai</i>	
Clustering Based on the In-Tree Graph Structure and Affinity Propagation .....	670
<i>Teng Qiu and Yongjie Li</i>	
PM2.5 Concentration Estimation Based on Image Quality Assessment .....	676
<i>Benqian Yang and Qiang Chen</i>	
Collaborative Representation-based Classification Method Using Weighted Multi-scale LBP for Image Recognition .....	682
<i>Xiaoning Song and Yao Chen</i>	
 <b>Signal Processing (Signal, Speech, Image)</b>	
Structured Discriminative Dictionary Learning Based on Schatten-p Norm Low-Rank Representation .....	688
<i>Hao Zheng, Heyou Chang, and Fanlong Zhang</i>	
Simple and Effective Speech Enhancement for Visual Microphone .....	694
<i>Juhyun Ahn and Daijin Kim</i>	
Human Pose Estimation via Multi-resolution Convolutional Neural Network .....	700
<i>Aichun Zhu, Jing Jin, Tian Wang, and Qiurong Zhu</i>	
Investigating the Stacked Phonetic Bottleneck Feature for Speaker Verification with Short Voice Commands .....	706
<i>Yichi Huang, Yuexian Zou, and Yi Liu</i>	
Sum-Fusion and Cascaded Interpolation for Semantic Image Segmentation .....	712
<i>Yan Wang, Jiani Hu, and Weihong Deng</i>	
Hierarchical Co-salient Object Detection via Color Names .....	718
<i>Jing Lou, Fenglei Xu, Qingyuan Xia, Wankou Yang, and Mingwu Ren</i>	
Compressed Sensing Natural Imaging via Hadamard-Diagonal Matrix .....	725
<i>Ying Zhou, Quansen Sun, Yazhou Liu, and Jixin Liu</i>	
Single Image Super-Resolution via Mixed Examples and Sparse Representation .....	730
<i>Weirong Liu, Changhong Shi, Chaorong Liu, and Jie Liu</i>	

Kernel Block-Sparse Representation for Classification .....	735
<i>Krishan Sharma and Renu Rameshan</i>	
A Complete Dual-Cross Pattern for Unconstrained Texture Classification .....	741
<i>Swalpa K. Roy, Bhabatosh Chanda, Bidyut B. Chaudhari, Dipak K. Ghosh, and Shiv Ram Dubey</i>	
 <b>Media Processing and Interaction (Video, Document, Medical, Biometrics, HCI and VR)</b>	
Unconstrained OCR for Urdu Using Deep CNN-RNN Hybrid Networks .....	747
<i>Mohit Jain, Minesh Mathew, and C.V. Jawahar</i>	
Crowdsourced Annotations as an Additional Form of Data Augmentation for CAD Development .....	753
<i>Pujitha Appan Kandala and Jayanthi Sivaswamy</i>	
Enhancing Protein-ATP and Protein-ADP Binding Sites Prediction Using Supervised Instance-Transfer Learning .....	759
<i>Jun Hu, Zi Liu, and Dong-Jun Yu</i>	
Motion-Pose Recurrent Neural Network with Instantaneous Kinematic Descriptor for Skeleton Based Gesture Detection and Recognition .....	764
<i>Zhi Zhang, Yonghong Song, and Yuanlin Zhang</i>	
Fingerprint Indexing Based on Minutia-Centred Deep Convolutional Features .....	770
<i>Dehua Song, Yao Tang, and Jufu Feng</i>	
A News-Driven Recurrent Neural Network for Market Volatility Prediction .....	776
<i>Peikang Lin, Xianjie Mo, Guidong Lin, Liwen Ling, Tingting Wei, and Wei Luo</i>	
A New GVF Arrow Pattern for Character Segmentation from Double Line License Plate Images .....	782
<i>Palaiahnakote Shivakumara, Aishik Konwer, Abir Bhowmick, Vijeta Khare, Umapada Pal, and Tong Lu</i>	
An Adaptive Convolutional Neural Network Framework for Multi-user Myoelectric Interfaces .....	788
<i>Keun-Tae Kim, Ki-Hee Park, and Seong-Whan Lee</i>	
Automatic Labanotation Generation from Motion-Captured Data Based on Hidden Markov Models .....	793
<i>Min Li, Zhenjiang Miao, and Cong Ma</i>	
EEG-based Classification of Consciousness during Sedation Using Global Spectra Principal Components .....	799
<i>Seul-Ki Yeom, Hwi-Jae Kim, Kwang-Suk Seo, Hyun Jeong Kim, and Seong-Whan Lee</i>	
Handwritten Chinese Character Blind Inpainting with Conditional Generative Adversarial Nets .....	804
<i>Zhao Zhong, Fei Yin, Xu-Yao Zhang, and Cheng-Lin Liu</i>	

Rethinking Feature Learning Approach for Face Verification .....	810
<i>Jiahui Du, Zhenjiang Miao, and Qiang Zhang</i>	
Deep Convolutional Neural Network Based Hidden Markov Model for Offline Handwritten Chinese Text Recognition .....	816
<i>Zi-Rui Wang, Jun Du, Jin-Shui Hu, and Yu-Long Hu</i>	
Fingerprint Image Enhancement Based on Classification DBMs Reconstruction .....	N/A
<i>Weixin Bian and Shifei Ding</i>	
Identifying People Using Temporal and Spatial Changes in Local Movements Measured from Body Sway .....	828
<i>Takuya Kamitani, Hiroki Yoshimura, Masashi Nishiyama, and Yoshio Iwai</i>	
Fast Genre Classification of Web Images Using Global and Local Features .....	834
<i>Guo-Shuai Liu, Fei Yin, Zhen-Bo Luo, and Cheng-Lin Liu</i>	
Detecting Driver's Braking Intention Using Recurrent Convolutional Neural Networks Based EEG Analysis .....	840
<i>Suk-Min Lee, Jeong-Woo Kim, and Seong-Whan Lee</i>	
Holistic Handwritten Uyghur Word Recognition Using Convolutional Neural Networks .....	846
<i>Wujiahemaiti Simayi, Askar Hamdulla, and Cheng-Lin Liu</i>	
Adaptive Energy Selection for Content-Aware Image Resizing .....	852
<i>Kazuma Sasaki, Yuya Nagahama, Zheng Ze, Satoshi Iizuka, Edgar Simo-Serra, Yoshihiko Mochizuki, and Hiroshi Ishikawa</i>	
Feature-Based Non-rigid Registration of Serial Section Images by Blending Rigid Transformations .....	858
<i>Takehiro Kajihara, Takuya Funatomi, Hiroyuki Kubo, Takahito Aoto, Haruyuki Makishima, Shigehito Yamada, and Yasuhiro Mukaigawa</i>	
Common Representation Learning Using Step-Based Correlation Multi-modal CNN .....	864
<i>Gaurav Bhatt, Piyush Jha, and Balasubramanian Raman</i>	
Integrating Bidirectional LSTM with Inception for Text Classification .....	870
<i>Wei Jiang and Zhong Jin</i>	
Large Vocabulary Hybrid DNN/HMM Arabic Online Handwriting Recognition System .....	876
<i>Omar Khaled Ali Ragab, Aly Fahmy, and Sherif Abdou</i>	
An Efficient Approach for Recognition and Verification of On-Line Signatures Using PSO .....	882
<i>Saikat Dutta, Rajkumar Saini, Pradeep Kumar, and Partha Pratim Roy</i>	
A Deep Learning Framework for Segmentation of Retinal Layers from OCT Images .....	888
<i>Karthik Gopinath, Samrudhdi B Rangrej, and Jayanthi Sivaswamy</i>	
Video Object Segmentation via Cellular Automata Refinement .....	894
<i>Ding-Jie Chen, Hwann-Tzong Chen, and Long-Wen Chang</i>	

SignInstructor: An Effective Tool for Sign Language Vocabulary Learning .....	900
<i>Xiujuan Chai, Zhuang Liu, Yongjun Li, Fang Yin, and Xilin Chen</i>	
A Hierarchical Classification Strategy for Robust Detection of Passive/Active Mental State Using User-Voluntary Pitch Imagery Task .....	906
<i>Young-Jin Kee, Min-Ho Lee, John Williamson, and Seong-Whan Lee</i>	
Self-Correction Method for Automatic Data Annotation .....	911
<i>Ce Liu, Tonghua Su, and Lijuan Yu</i>	
Learning Pairwise-Similarity Guided Sparse Functional Connectivity Network for MCI Classification .....	917
<i>Xiaobo Chen, Han Zhang, Yu Zhang, Zuoyong Li, and Dinggang Shen</i>	
UBSegNet: Unified Biometric Region of Interest Segmentation Network .....	923
<i>Ranjeet Ranjan Jha, Daksh Thapar, Shreyas Malakarjun Patil, and Aditya Nigam</i>	
A Geometric View Transformation Model Using Free-Form Deformation for Cross-View Gait Recognition .....	929
<i>Hazem El-Alfy, Chi Xu, Yasushi Makihara, Daigo Muramatsu, and Yasushi Yagi</i>	
A Deep Learning Approach to Appearance-Based Gaze Estimation under Head Pose Variations .....	935
<i>Hsin-Pei Sun, Cheng-Hsun Yang, and Shang-Hong Lai</i>	
Multilingual-Signature Verification by Verifier Fusion Using Random Forests .....	941
<i>Keg Matsuda, Wataru Ohyama, and Tetsushi Wakabayashi</i>	
Writer Identification in Indic Scripts: A Stroke Distribution Based Approach .....	947
<i>Santhoshini Reddy, Chris Andrew, Umapada Pal, Alireza Alaei, and Viswanath Pulabaigari</i>	
Hand Gesture Sequence Recognition Using Inertial Motion Units (IMUs) .....	953
<i>Dilip Chakravarthy Kavarthapu and Kaushik Mitra</i>	

## Author Index