

# Contents – Part I

## Evolutionary Computation and Learning

Gbest-Guided Covariance Matrix Adaptation Evolution Strategy for Large Scale Global Optimization . . . . .	3
<i>Zhang Fuxing, Zhang Tao, and Wang Rui</i>	
A Fast Approximate Hypervolume Calculation Method by a Novel Decomposition Strategy . . . . .	14
<i>Weisen Tang, Hailin Liu, and Lei Chen</i>	
Towards the Differentiation of Initial and Final Retention in Massive Open Online Courses. . . . .	26
<i>Raghad Al-Shabandar, Abir Hussain, Andy Laws, Robert Keight, and Janet Lunn</i>	
An Evolutionary Algorithm for Autonomous Agents with Spiking Neural Networks. . . . .	37
<i>Xianghong Lin, Fanqi Shen, and Kun Liu</i>	
Sparse Reconstruction with Bat Algorithm and Orthogonal Matching Pursuit. . . . .	48
<i>Chunmei Zhang, Xingjuan Cai, and Zhentao Shi</i>	
Data Transfer and Extension for Mining Big Meteorological Data. . . . .	57
<i>Tianwen Huang and Fei Jiao</i>	

## Neural Networks

A Review of Image Recognition with Deep Convolutional Neural Network . . . . .	69
<i>Qing Liu, Ningyu Zhang, Wenzhu Yang, Sile Wang, Zhenchao Cui, Xiangyang Chen, and Liping Chen</i>	
Enhance a Deep Neural Network Model for Twitter Sentiment Analysis by Incorporating User Behavioral Information. . . . .	81
<i>Ahmed Sulaiman M. Alharbi and Elise DeDoncker</i>	
Topological Structure Analysis of Developmental Spiking Neural Networks . . .	89
<i>Xianghong Lin, Ying Li, and Jichang Zhao</i>	
A Unified Deep Neural Network for Scene Text Detection. . . . .	101
<i>Yixin Li and Jinwen Ma</i>	

Exploring the New Application of Morphological Neural Networks. . . . . 113  
*Bin Sun and Naiqin Feng*

An Improved Evolutionary Random Neural Networks Based on Particle  
 Swarm Optimization and Input-to-Output Sensitivity . . . . . 121  
*Qing-Hua Ling, Yu-Qing Song, Fei Han, and Hu Lu*

**Nature Inspired Computing and Optimization**

Evolutionary Metaphor of Genetic Encoding for Self-organizable Robots . . . . 131  
*Kiwon Yeom*

Hybrid Coordinating Algorithm for Flying Robots . . . . . 140  
*Kiwon Yeom*

**Signal Processing**

A Method to Detecting Ventricular Tachycardia and Ventricular Fibrillation  
 Based on Symbol Entropy and Wavelet Analysis . . . . . 155  
*Yingda Wei, Qingfang Meng, Haihong Liu, Mingmin Liu,  
 and Hanyong Zhang*

Saliency-Guided Smoothing for 3D Point Clouds . . . . . 165  
*Feng Yan, Fei Wang, Yu Guo, and Peilin Jiang*

**Pattern Recognition**

Color Two-Dimensional Principal Component Analysis for Face  
 Recognition Based on Quaternion Model . . . . . 177  
*Zhi-Gang Jia, Si-Tao Ling, and Mei-Xiang Zhao*

Image Recognition Using Local Features Based NNSC Model . . . . . 190  
*Li Shang, Yan Zhou, and Zhanli Sun*

A Hashing Image Retrieval Method Based on Deep Learning and Local  
 Feature Fusion . . . . . 200  
*Yi-Liang Nie, Ji-Xiang Du, and Wen-Tao Fan*

Anomaly Detection by Analyzing the Pedestrian Behavior and the Dynamic  
 Changes of Behavior . . . . . 211  
*Maying Shen, Xinghao Jiang, and Tanfeng Sun*

Locality Preserving Projections with Adaptive Neighborhood Size . . . . . 223  
*Wenjun Hu, Xinmin Cheng, Yunliang Jiang, Kup-Sze Choi,  
 and Jungang Lou*

Research on Feature Selection and Predicting ALS Disease Progression. . . . . 235  
*Jin Li, Shu-Lin Wang, and JingJing Wang*

Automatic Tongue Image Segmentation for Traditional Chinese Medicine  
 Using Deep Neural Network. . . . . 247  
*Panling Qu, Hui Zhang, Li Zhuo, Jing Zhang, and Guoying Chen*

P2P Traffic Identification Method Based on Traffic  
 Statistical Characteristics . . . . . 260  
*Bing Hu and Zhixin Sun*

ChinFood1000: A Large Benchmark Dataset for Chinese Food Recognition . . . 273  
*Zhihui Fu, Dan Chen, and Hongyu Li*

Plant Species Recognition Based on Deep Convolutional Neural Networks. . . . 282  
*Shanwen Zhang and Chuanlei Zhang*

**Biometrics Recognition**

Effective Iris Recognition for Distant Images Using Log-Gabor Wavelet  
 Based Contourlet Transform Features . . . . . 293  
*Lasker Ershad Ali, Junfeng Luo, and Jinwen Ma*

Facial Expression Recognition Using Double-Stage Sample-Selected SVM. . . . 304  
*Ting Yu and Xiaodong Gu*

**Image Processing**

MMW Image Restoration Using the Combination Method of Modified  
 Fuzzy RBFNN and Sparse Representation . . . . . 319  
*Li Shang, Yan Zhou, and Zhanli Sun*

A Novel Detection of Ventricular Tachycardia and Fibrillation Based on  
 Degree Centrality of Complex Network . . . . . 329  
*Haihong Liu, Qingfang Meng, Qiang Zhang, Yingda Wei, Mingmin Liu,  
 and Hanyong Zhang*

Deep Convolutional Networks-Based Image Super-Resolution . . . . . 338  
*Guimin Lin, Qingxiang Wu, Xixian Huang, Lida Qiu, and Xiyao Chen*

Traffic Road Sign Detection and Recognition in Natural Environment  
 Using RGB Color Model . . . . . 345  
*Han Huang and Ling-Ying Hou*

Active Contour Integrating Patch-Level and Pixel-Level Features . . . . . 353  
*Xinyue Mao, Yufei Chen, Xianhui Liu, and Weidong Zhao*

Study on Prior-Altitude-Locating-Algorithm for Video Target Based on UAV. . . . . 366  
*Wen-Bo Zhao and Hai-Long Ding*

Data Reduction for Point Cloud Using Octree Coding . . . . . 376  
*Shanwei Song, Jing Liu, and Changqing Yin*

Seat Belt Detection Using Convolutional Neural Network BN-AlexNet . . . . . 384  
*Bin Zhou, Dongfang Chen, and Xiaofeng Wang*

A Study on Lung Image Retrieval Based on the Vocabulary Tree . . . . . 396  
*Kun Liu, Qing Chen, and Kun Ma*

A More Robust Active Contour Model with Group Similarity . . . . . 408  
*Shaozhu Chen, Xiaodong Zhao, Xianhui Liu, and Yufei Chen*

A New Infrared and Visible Image Fusion Algorithm in NSCT Domain . . . . . 420  
*Xiaochun Wang, Lijun Yao, Ruixia Song, and Huiyang Xie*

Methods for Eliminating the Complex Background of Pedestrian Images . . . . . 432  
*Di Wu, Si-Jia Zheng, You-hua Zhang, and Zhi-peng Li*

**Information Security**

Image Encryption Algorithms Based on Non-uniform Second-Order Reversible Cellular Automata with Balanced Rules . . . . . 445  
*Kai Li, Mingyu Sun, Lvzhou Li, and Juhua Chen*

**Virtual Reality and Human-Computer Interaction**

Multimodal Usability of Human-Computer Interaction Based on Task-Human-Computer-Centered Design . . . . . 459  
*Yanbin Shi, Xiaoqi Li, Dantong Ouyang, and Hongtao Jiang*

**Business Intelligence and Multimedia Technology**

Double H.264 Compression Detection Scheme Based on Prediction Residual of Background Regions . . . . . 471  
*Junjia Zheng, Tanfeng Sun, Xinghao Jiang, and Peisong He*

**Genetic Algorithms**

Research on Multi-UAV Loading Multi-type Sensors Cooperative Reconnaissance Task Planning Based on Genetic Algorithm. . . . . 485  
*Ji-Ting Li, Sheng Zhang, Zhan Zheng, Li-Ning Xing, and Ren-Jie He*

Discriminative Motif Elicitation via Maximization  
of Statistical Overrepresentation. . . . . 501  
*Ning Li*

**Biomedical Informatics Theory and Methods**

DSD-SVMs: Human Promoter Recognition Based on Multiple Deep  
Divergence Features . . . . . 515  
*Wenxuan Xu, Wenzheng Bao, Lin Yuan, and ZhiChao Jiang*

MD-MSVMs: A Human Promoter Recognition Method Based on Single  
Nucleotide Statistics and Multilayer Decision . . . . . 527  
*Wenxuan Xu, Wenzheng Bao, Lin Yuan, and ZhiChao Jiang*

A Novel Computational Method for MiRNA-Disease  
Association Prediction . . . . . 539  
*Zhi-Chao Jiang, Zhen Shen, and Wenzheng Bao*

**Particle Swarm Optimization and Niche Technology**

Petri Net Model and Its Optimization for the Problem of Robot Rescue  
Path Planning . . . . . 551  
*Na Geng, Dun-wei Gong, and Yong Zhang*

**Swarm Intelligence and Optimization**

Aircraft Scheduling Considering Discrete Airborne Delay and Holding  
Pattern in the Near Terminal Area. . . . . 567  
*K.K.H. Ng and C.K.M. Lee*

Minimization of Makespan Through Jointly Scheduling Strategy  
in Production System with Mould Maintenance Consideration . . . . . 577  
*Xiaoyue Fu, Felix T.S. Chan, Ben Niu, S.H. Chung, and Ying Bi*

Chaotic Optimization of Tethered Kites for Wind Energy Generator . . . . . 587  
*Junfang Li, Mingwei Sun, Zenghui Wang, and Zengqiang Chen*

A Machine Vision Method for Automatic Circular Parts Detection Based  
on Optimization Algorithm. . . . . 600  
*Wenyan Wang, Kun Lu, Rui Hong, Peng Chen, Jun Zhang,  
and Bing Wang*

Univariate Gaussian Model for Multimodal Inseparable Problems . . . . . 612  
*Geng Zhang, Yangmin Li, Bingxiao Ding, and Yun Li*

Whale Swarm Algorithm for Function Optimization . . . . . 624  
*Bing Zeng, Liang Gao, and Xinyu Li*

The Container Truck Route Optimization Problem by the Hybrid PSO-ACO Algorithm. . . . . 640  
*Yi Liu, Mao Feng, and Sabina Shahbazzade*

A New Adaptive Firefly Algorithm for Solving Optimization Problems . . . . . 649  
*Wenjun Wang, Hui Wang, Jia Zhao, and Li Lv*

A Hybrid Algorithm of Adaptive Particle Swarm Optimization Based on Adaptive Moment Estimation Method . . . . . 658  
*Yan Jiang and Fei Han*

An Improved Multi-swarm Particle Swarm Optimization Based on Knowledge Billboard and Periodic Search Mechanism . . . . . 668  
*Pan-pan Du and Fei Han*

**Independent Component Analysis**

Quantile Kurtosis in ICA and Integrated Feature Extraction for Classification. . . . . 681  
*Md Shamim Reza and Jinwen Ma*

**Compressed Sensing and Sparse Coding**

Similarity Matrix Construction Methods in Sparse Subspace Clustering Algorithm for Hyperspectral Imagery Clustering . . . . . 695  
*Qing Yan, Yun Ding, Jing-Jing Zhang, Li-Na Xun, and Chun-Hou Zheng*

**Natural Computing**

A Fast Optimization Algorithm for *K*-Coverage Problem . . . . . 703  
*Jingwen Pei, Maomao, and Jiayin Wang*

**Intelligent Computing in Computer Vision**

Human Carrying Baggage Classification Using Transfer Learning on CNN with Direction Attribute . . . . . 717  
*Wahyono and Kang-Hyun Jo*

Fully Combined Convolutional Network with Soft Cost Function for Traffic Scene Parsing . . . . . 725  
*Yan Wu, Tao Yang, Junqiao Zhao, Linting Guan, and Jiqian Li*

**Computational Intelligence and Security for Image Applications  
in Social Network**

Pedestrian Detection Based on Fast R-CNN and Batch Normalization . . . . . 735  
*Zhong-Qiu Zhao, Haiman Bian, Donghui Hu, Wenjuan Cheng,  
 and Hervé Glotin*

**Neural Networks: Theory and Application**

Dynamic Analysis and Simulation for Two Different Chaos-Like Stochastic  
 Neural Firing Patterns Observed in Real Biological System . . . . . 749  
*Huijie Shang, Rongbin Xu, and Dong Wang*

Smooth Multi-instance Learning for Object Detection . . . . . 758  
*Dayuan Li, Zhipeng Li, and Youhua Zhang*

A Novel Method for Generating Benchmark Functions Using Recurrent  
 Neural Network . . . . . 768  
*Fengyang Sun, Lin Wang, Bo Yang, Jin Zhou, and Zhenxiang Chen*

Optimization of Neural Tree Based on Good Point Set . . . . . 774  
*Hao Teng, Yuehui Chen, and Shixian Wang*

A Three-Step Deep Neural Network Methodology for Exchange  
 Rate Forecasting . . . . . 786  
*Juan Carlos Figueroa-García, Eduyn López-Santana,  
 and Carlos Franco-Franco*

Android Malware Clustering Analysis on Network-Level Behavior . . . . . 796  
*Shanshan Wang, Zhenxiang Chen, Xiaomei Li, Lin Wang, Ke Ji,  
 and Chuan Zhao*

**Author Index** . . . . . 809



<http://www.springer.com/978-3-319-63308-4>

Intelligent Computing Theories and Application  
13th International Conference, ICIC 2017, Liverpool, UK,  
August 7-10, 2017, Proceedings, Part I  
Huang, D.-S.; Bevilacqua, V.; Premaratne, P.; Gupta, P.  
(Eds.)  
2017, XXI, 815 p. 330 illus., Softcover  
ISBN: 978-3-319-63308-4