

# Table of Contents

Worst-Case Execution Time Test Generation for Solutions of the Knapsack Problem Using a Genetic Algorithm . . . . .	1
<i>Maxim Buzdalov and Anatoly Shalyto</i>	
The Application of Spiking Neural P Systems for PLC Programming . . .	11
<i>Ke Chen, Jun Wang, Zhang Sun, Juan Luo, and Tao Liu</i>	
Criteria for Nonsingular $H$ -Matrices . . . . .	16
<i>Qi Chen and Min Li</i>	
Molecular Dynamic Simulation for Heat Capacity of $MgSiO_3$ Perovskite . . . . .	24
<i>Qiong Chen</i>	
Molecular Model for Information Addressing and Transporting Based on DNA Nanotechnology . . . . .	29
<i>Zhihua Chen, Xiaoli Qiang, and Kai Zhang</i>	
Real-Coded Genetic Algorithm with Oriented Search towards Promising Region for Parameter Optimization . . . . .	35
<i>Zhiqiang Chen, Yun Jiang, and Xudong Chen</i>	
A Population-P-Systems-Inspired Membrane Algorithm for Multi-objective Optimization . . . . .	40
<i>Jixiang Cheng, Gexiang Zhang, and Yanhui Qin</i>	
The Algorithms and Composition of a Travel System Based on Geographical Information . . . . .	45
<i>Wen Cheng and Zheng Zhang</i>	
The Modular Inversion in $GF(p)$ by Self-assembling and Its Application to Elliptic Curve Diffie-Hellman Key Exchange . . . . .	57
<i>Zhen Cheng and Yufang Huang</i>	
Using Support Vector Machine to Identify Imaging Biomarkers of Major Depressive Disorder and Anxious Depression . . . . .	63
<i>Minyue Chi, Shengwen Guo, Yuping Ning, Jie Li, Haochen Qi, Minjian Gao, Jiezin Wang, Xiaowei Hu, Yangbo Guo, Yuling Yang, Hongjun Peng, and Kai Wu</i>	
An Adaptive Differential Evolution Algorithm with Automatic Population Resizing for Global Numerical Optimization . . . . .	68
<i>Tae Jong Choi and Chang Wook Ahn</i>	

An Improved Method of DNA Information Encryption . . . . .	73
<i>Guangzhao Cui, Dong Han, Yan Wang, Yanfeng Wang, and Zicheng Wang</i>	
An Encryption Scheme Based on DNA Microdots Technology . . . . .	78
<i>Guangzhao Cui, Yan Wang, Dong Han, Yanfeng Wang, Zicheng Wang, and Yanmin Wu</i>	
Simulation DNA Algorithm . . . . .	83
<i>Peng Dai, Kang Zhou, Zhiwei Wei, Di Hu, and Chun Liu</i>	
Research on Improved Locally Linear Embedding Algorithm . . . . .	88
<i>Tuo Deng, Yanni Deng, Yuan Shi, and Xiaoqi Zhou</i>	
An Improved Evolutionary Approach for Association Rules Mining . . . . .	93
<i>Youcef Djenouri, Ahcene Bendjoudi, Nadia Nouali-Taboudjemat, and Zineb Habbas</i>	
Multiple Depots Incomplete Open Vehicle Routing Problem Based on Carbon Tax . . . . .	98
<i>Fenghua Duan and Xiaonian He</i>	
Research on a Class of Nonlinear Matrix Equation . . . . .	108
<i>Jiating Fang, Haifeng Sang, Qingchun Li, and Bo Wang</i>	
On the Convergence of Levenberg-Marquardt Method for Solving Nonlinear Systems . . . . .	117
<i>Minglei Fang, Feng Xu, Zhibin Zhu, Lihua Jiang, and Xianya Geng</i>	
DNA-Chip-Based Information Hiding Scheme (Extended Abstract) . . . . .	123
<i>Xiwen Fang and Xuejia Lai</i>	
Locate Multiple Pareto Optima Using a Species-Based Multi-objective Genetic Algorithm . . . . .	128
<i>Yaping Fu, Hongfeng Wang, and Min Huang</i>	
Expert Self-tuning Using Fuzzy Reasoning for PID Controller . . . . .	138
<i>Tao Geng, Yunfei Lv, and Yang Liu</i>	
Research for Performance Evaluation of University Teachers . . . . .	142
<i>Haixia Gui</i>	
Enterprise Network Sustainability through Bio-inspired Scheme . . . . .	148
<i>Sami J. Habib, Paulvanna N. Marimuthu, and Tahani H. Hussain</i>	
An Edge Detection Algorithm Based on Morphological Gradient and the Otsu Method . . . . .	161
<i>Lu Han and Aili Han</i>	

Method for Forecasting Medium and Long-Term Power Loads Based on the Chaotic CPSO-GM .....	165
<i>Libo Hao, Aijia Ouyang, and Libin Liu</i>	
Solving the Multiobjective Multiple Traveling Salesmen Problem Using Membrane Algorithm .....	171
<i>Juanjuan He</i>	
A Novel Method to Derive Ambulatory Blood Pressure from the Radial Pressure Waveform .....	176
<i>Long He, Zhihua Chen, and Zheng Zhang</i>	
Association Rule Mining Based on Bat Algorithm .....	182
<i>Kamel Eddine Heraguemi, Nadjat Kamel, and Habiba Drias</i>	
Adaptive Mutation Behavior for Quantum Particle Swarm Optimization .....	187
<i>Zhehuang Huang</i>	
Bifurcation and Global Synchronization Analysis in Diffusively Coupled Calcium Oscillators .....	192
<i>Yuhong Huo and Yi Zhou</i>	
News Sentiments Grading Using Multiple Dictionaries Based Lexical Approach .....	198
<i>Adeel Iqbal and Shoab Ahmad Khan</i>	
Uniform Solution to Partition Problem Using P Systems with Membrane Division .....	204
<i>Yun Jiang and Zhiqiang Chen</i>	
Relating the Languages of Transition P Systems and Evolution-Communication P Systems with Energy (Extended Abstract) .....	211
<i>Richelle Ann B. Juayong and Henry N. Adorna</i>	
Myo-Signal Based Intuitive Driving Interface: Development and Evaluation .....	216
<i>Jinuk Kim, Sungyoon Lee, and Jaehyo Kim</i>	
Reversible Spiking Neural P Systems with Astrocytes .....	221
<i>Yuan Kong, Xiaolong Shi, Jinbang Xu, and Xinquan Huang</i>	
On String Languages Generated by Spiking Neural P Systems with Astrocytes .....	225
<i>Yuan Kong, Zheng Zhang, and Yang Liu</i>	
A Hybrid Bat Based Feature Selection Approach for Intrusion Detection .....	230
<i>Mohamed Amine Laamari and Nadjat Kamel</i>	

An Ensemble Pattern Classification System Based on Multitree Genetic Programming for Improving Intension Pattern Recognition Using Brain Computer Interaction .....	239
<i>Jong-Hyun Lee, Jinung An, and Chang Wook Ahn</i>	
Diagnosis of Osteoporosis by Quantification of Trabecular Microarchitectures from Hip Radiographs Using Artificial Neural Networks .....	247
<i>Ju Hwan Lee, Yoo Na Hwang, Sung Yun Park, and Sung Min Kim</i>	
A New Kind of Model of Laminar Cooling: By LS-SVM and Genetic Algorithm.....	251
<i>Shuanghong Li, Xi Li, and Zhonghua Deng</i>	
The Application of Artificial Bee Colony Algorithm in Protein Structure Prediction.....	255
<i>Yanzhang Li, Changjun Zhou, and Xuedong Zheng</i>	
Find Dense Correspondence between High Resolution Non-rigid 3D Human Faces .....	259
<i>Jian Liu, Quan Zhang, and Chaojing Tang</i>	
An Improved Particle Swarm Optimization and Its Application for Micro-grid Economic Operation Optimization .....	276
<i>Tao Liu, Jun Wang, Zhang Sun, Juan Luo, Tingting He, and Ke Chen</i>	
On the Theory of Nonlinear Matrix Equation $X^s = Q + A^H(I \otimes X - C)^{-s}A$ .....	281
<i>Wei Liu, Haifeng Sang, Qingchun Li, and Chunwei Zhai</i>	
Design of Coal Mine Monitoring System Based on Internet of Things ...	289
<i>Xiangju Liu and Lina Liu</i>	
Optimal Tuning of PI Controller for Full-Order Flux Observer of Induction Motor Using the Immune Genetic Algorithm .....	295
<i>Hui Luo, Yunfei Lv, Quan Yin, and Huajun Zhang</i>	
A Novel Membrane Algorithm to Finding Global Shipping Route .....	300
<i>Tao Luo, Yajun She, and Zongyuan Yang</i>	
Firefly Algorithm Solving Equal-Task Multiple Traveling Salesman Problem .....	304
<i>Jianhua Ma, Mingfu Li, Yuyan Zhang, and Houming Zhou</i>	
Accelerated Simulation of P Systems on the GPU: A Survey.....	308
<i>Miguel A. Martínez-del-Amor, Luis F. Macías-Ramos, Luis Valencia-Cabrera, Agustín Riscos-Núñez, and Mario J. Pérez-Jiménez</i>	

Accepting <i>H</i> -Array Splicing Systems .....	313
<i>V. Masilamani, D.K. Sheena Christy, D.G. Thomas, Atulya K. Nagar, and Robinson Thamburaj</i>	
Research on Magnetotactic Bacteria Optimization Algorithm Based on the Best Individual .....	318
<i>Hongwei Mo, Lili Liu, Lifang Xu, and Yanyan Zhao</i>	
Uniform Solution to Common Algorithmic Problem in the Minimally Parallel Mode .....	323
<i>Yunyun Niu, Ibrahim Venkat, Ahamad Tajudin Khader, and K.G. Subramanian</i>	
A Novel Task Scheduling Scheme in Heterogeneous Computing Systems Using Chemical Reaction Optimization .....	328
<i>Guo Pan, Kenli Li, Yuming Xu, and Keqin Li</i>	
Public Traffic Network Simulation System .....	336
<i>Wen Jin Rong, Kang Zhou, Peng Dai, Song Ping Li, and Wei Tan</i>	
An Improved Golden Ball Algorithm for the Capacitated Vehicle Routing Problem .....	341
<i>Kanjana Ruttanateerawichien, Werasak Kurutach, and Tantikorn Pichpibul</i>	
A New Method for Singular Polynomial Systems .....	357
<i>Haifeng Sang, Panpan Liu, Qingchun Li, and Yan Li</i>	
Accepting String Graph Splicing System .....	364
<i>Meena Parvathy Sankar, N.G. David, and D.G. Thomas</i>	
ABC Algorithm for VRP .....	370
<i>Kai Shao, Kang Zhou, Jiang Qiu, and Juan Zhao</i>	
Joint Estimation of QTL Positions and Effects in Multiple-Interval Mapping for Count Trait .....	374
<i>Xiaona Sheng, Weijun Ma, and Ying Zhou</i>	
Based on Different Atom of Protein Backbone Predicting Protein Structural Class .....	379
<i>Xiaohong Shi and Qian Fan</i>	
On Directional Bias for Network Coverage .....	384
<i>Graeme Smith, J.W. Sanders, and Qin Li</i>	
Computational Efficiency and Universality of Timed P Systems with Membrane Creation .....	389
<i>Bosheng Song, Mario J. Pérez-Jiménez, and Linqiang Pan</i>	

A Membrane-Inspired Evolutionary Algorithm Based on Artificial Bee Colony Algorithm .....	395
<i>Xiaoxiao Song and Jun Wang</i>	
The Intelligent Editing Based on Perception for Structuring Digital Ink .....	411
<i>Rui Su</i>	
Compactly and Weakly Compactly Strongly Exposed Properties in Musielak-Orlicz Sequence Spaces Equipped with the Orlicz Norm .....	416
<i>Lihuan Sun</i>	
Extended Extreme Learning Machine for Tensorial Signal Classification .....	420
<i>Shuai Sun, Bin Zhou, and Fan Zhang</i>	
A Report on Uncorrelated Multilinear PCA Plus Extreme Learning Machine to Deal with Tensorial Data .....	425
<i>Shuai Sun, Bin Zhou, and Fan Zhang</i>	
Quantum Statistical Edge Detection Using Path Integral Monte Carlo Simulation .....	430
<i>Yangguang Sun</i>	
Intelligent Model-Based Speed Controller Design for PMSM .....	435
<i>Lisi Tian, Yang Liu, and Jin Zhao</i>	
Phase-Locked Loop (PLL) Type Sensorless Control of PMSM Using Neural Network Filter .....	440
<i>Lisi Tian, Jin Zhao, and Zhenfeng Peng</i>	
Facial Expression Recognition Based on Feature Block and Local Binary Pattern .....	447
<i>Wencheng Wang and Faliang Chang</i>	
Multiple Positive Solutions of Nonlinear Fourth-Order Singular P-Laplacian Resonant Problems .....	452
<i>Xuchao Wang and Libo Wang</i>	
A 3D DNA Self-assembly Model and Algorithm for Minimum Spanning Tree Problem .....	457
<i>Zicheng Wang, Lizheng Bian, Yanfeng Wang, and Guangzhao Cui</i>	
Multi-digit Logic Operation Using DNA Strand Displacement .....	463
<i>Zicheng Wang, Guihua Tian, Yan Wang, Yanfeng Wang, and Guangzhao Cui</i>	
Existence of Multiple Positive Solutions of Nonlinear Singular Fourth-Order Problems Involving the P-Laplacian .....	468
<i>Ying Wei, Min Wang, and Libo Wang</i>	

Real-Time Surgery Simulation Systems Based on Collision Detection ...	473
<i>Chang Wen and Kai Xie</i>	
Fuzzy RBF Neural PID Control to Simulation Turntable Servo System .....	478
<i>Yanmin Wu, Guangzhao Cui, and Xuncai Zhang</i>	
Three-Input Molecular Logic Based on Light-Control System .....	483
<i>Yuhui Xia, Shanshan Liu, Xiangxiang Chen, Ming Song, and Yafei Dong</i>	
The Reconstruction of 3D Human Face Based on the Post-Plastic Surgery .....	489
<i>Kai Xie, Bo Liu, Ningjun Ruan, and Jun Chen</i>	
PSO Application in Power System: Low-Frequency Oscillation Fault Analysis .....	494
<i>Wei Xiong, Xiaoya Hu, Zhuguo Li, and Lejiang Guo</i>	
Interference Avoidance Scheme for Relay-Based Device-to-Device Communication System in LTE Network .....	499
<i>Jianbin Xue and Supan Wei</i>	
Power Control Research Based on Interference Coordination for D2D Underlying Cellular Networks .....	505
<i>Jianbin Xue, Bing Wen, and Supan Wei</i>	
The Molecular Beacons Self-assembly Model of the Dislocation Permutation Problem .....	520
<i>Jing Yang, Zhixiang Yin, Mingqiang Chen, and Jianzhong Cui</i>	
Detecting Bots in Follower Markets .....	525
<i>Wu Yang, Guozhong Dong, Wei Wang, Guowei Shen, Liangyi Gong, Miao Yu, Jiguang Lv, and Yaxue Hu</i>	
Digital TV Program Recommendation System Based on Collaboration Filtering .....	531
<i>Fulian Yin, Jianping Chai, Hanlei Wang, and Ya Gao</i>	
A Variable Multidimensional Fuzzy Model and Its Application to Online Tidal Level Prediction .....	539
<i>Jianchuan Yin and Nini Wang</i>	
Research on Adaptive PI Controller of LCL-Filtered Voltage Source Rectifier with Neural-Network .....	544
<i>Quan Yin, Ronghui Lu, Qingyi Wang, Hui Luo, and Hu Guo</i>	
A DNA Computing Model on Triple-Stranded for Minimum Spanning Tree Problem .....	549
<i>Zhixiang Yin, Xia Sun, Feng Xu, Xianwen Fang, and Hui Xu</i>	

An Adaptive Unimodal and Hysteresis Thresholding Method . . . . .	552
<i>Yin Yu, Zhen Li, Bing Liu, and Xiangdong Liu</i>	
An Artificial Immune System Approach for Malware Detection . . . . .	557
<i>Jinquan Zeng and Weiwen Tang</i>	
Time-Free Tissue P Systems for Solving the Hamilton Path Problem ...	562
<i>Xiangxiang Zeng, Ningxiang Ding, Fei Xing, and Xiangrong Liu</i>	
Face Classification via a Novel Two-Dimensional Extreme Learning Machine . . . . .	566
<i>Fan Zhang, Lin Qi, and Enging Chen</i>	
Prediction Nucleic Acid Secondary Structure with Planar Pseudoknots and Genetic Algorithm . . . . .	571
<i>Kai Zhang, Xinquan Huang, Wei Hu, and Jun Liu</i>	
Accelerating Genetic Algorithm for Solving Graph Coloring Problem Based on CUDA Architecture . . . . .	578
<i>Kai Zhang, Ming Qiu, Lin Li, and Xiaoming Liu</i>	
Parallel Genetic Algorithm with OpenCL for Traveling Salesman Problem . . . . .	585
<i>Kai Zhang, Siman Yang, Li li, and Ming Qiu</i>	
Multiobjective Genetic Algorithm for Optimized DNA Sequences for DNA Self-assembly . . . . .	591
<i>Kai Zhang, Jiaren Yi, Jun Liu, and Wei Hu</i>	
Sufficient Conditions for Nonsingular $H$ -Matrices . . . . .	598
<i>Lijun Zhang and Min Li</i>	
PBIL Algorithm for Signal Timing Optimization of Isolated Intersection . . . . .	606
<i>Qingbin Zhang, Wenlei Dong, and Xianfang Xing</i>	
Application to Logic Circuits Using Combinatorial Displacement of DNA Strands . . . . .	611
<i>Xuncaizhang, Weiwei Zhang, Yanfeng Wang, and Guangzhao Cui</i>	
Microscan Imager Logging Data Compression Using improved Huffman Algorithm . . . . .	616
<i>Yanhui Zhang, He Zhang, Jun Shi, and Xiaozheng Yin</i>	
Decision-Making Strategies for Multi-objective Community Detection in Complex Networks . . . . .	621
<i>Yu Zhang, Xingyi Zhang, Jin Tang, and Bin Luo</i>	
A New Graphical Representation of Protein Sequences Based on Dual-Vector Model . . . . .	629
<i>Zhujin Zhang, Xiangxiang Zeng, Zhihua Chen, and Eric Ke Wang</i>	



New Fuzzy Probability Spaces and Fuzzy Random Variables Based on Gradual Numbers .....	633
<i>Caili Zhou and Peng Wang</i>	
Protein Structure Prediction Based on Improved Multiple Populations and GA-PSO .....	644
<i>Changjun Zhou, Tianyun Hu, and Shihua Zhou</i>	
A Multi-population Discrete Firefly Algorithm to Solve TSP .....	648
<i>Lingyun Zhou, Lixin Ding, and Xiaoli Qiang</i>	
Study and Application of DNA Cellular Automata Self-assembly .....	654
<i>Shihua Zhou, Bin Wang, Xuedong Zheng, and Changjun Zhou</i>	
Fixed Point in Fuzzy Metric Spaces .....	659
<i>Yinying Zhou</i>	
Shortest Path Problem with $k$ -Intermediate Vertex Constraints .....	664
<i>Chun Liu and Kang Zhou</i>	
<b>Author Index</b> .....	669