Contents

| Part I Heterogeneous Networks | |
|---|----|
| An Enhanced Cost Efficient Resource Scheduling Algorithm for Dense Heterogenous Networks | 3 |
| A Heterogeneous Ship Formation Network Selection Algorithm Based on Service Level and Load Balance | 13 |
| Stackelberg Game-Based Dynamic Spectrum Access Scheme in Heterogeneous Network | 25 |
| Distributed Estimation in Heterogeneous Sensor Networks Using Principal Component Analysis | 37 |
| An Adaptive Energy-Efficient Optimization Scheme in Future Massive MIMO HetNets | 45 |
| Signals Reconstruction in Heterogeneous Sensor Network with Distributed Compressive Sensing | 55 |
| Analysis for the Enhanced Cell Reselection Mechanism in Heterogeneous Wireless System | 65 |
| Part II Ad Hoc and Short Range Networks | |
| Energy Dissipation Balance Scheme in Dynamic Ad Hoc Networks | 77 |



xii Contents

| Research and Design of Monitoring Smog System Based on Wireless Intelligent Network | 85 |
|---|-----|
| Yanping Wu, Jincheng Wu, Jian Chen, Yingjie Wang, Yongyue Yang, Xin Lu and Qiufang Yu | 93 |
| Optimal Cooperation Strategy in Cognitive Relay Networks | |
| with Energy Harvesting | 93 |
| Improving the End-to-End Delay in Cognitive Radio Ad Hoc Networks | 103 |
| A Design on Monitoring Data Acquisition System Based on ZigBee Sensor Network for Unconventional Gas Wells | 111 |
| Nearest Access Routing Algorithm for the ZigBee Network in 5G Environment | 121 |
| Optimal Relay Placement for WSN-Based Home Health Monitoring System | 129 |
| Part III Radar and Sonar Networks, Radar Signal Processing | |
| A Multi-hop Acknowledgment Technique Based on Network Coding for Underwater Acoustic Communication Danfeng Zhao, Xiangyu Song and Guiyang Lun | 141 |
| An Envelope Alignment Method for Terahertz Radar ISAR Imaging of Maneuvering Targets | 153 |
| Terahertz Radar for Imaging Spinning Space Debris Xu Yang, Zongjie Cao and Rui Min | 161 |
| Cluster-Head Election Using Fuzzy Logic Systems in Radar Sensor Networks | 171 |
| Raw Data Reduction for Synthetic Aperture Based on SVD-QR Na Wu and Qilian Liang | 181 |
| A Novel Artificial Bee Colony Algorithm for Radar Polyphase Code Design | 193 |

Contents xiii

| A New Rain/Snow Clutters Suppression Algorithm for Ship Navigational Radar | 203 |
|---|-----|
| Zengshan Tian, Shuang Li and Zhengwu Yuan | |
| Interferometric Phase Error Correction for Ka-Band InSAR via BP | 213 |
| SAR Image De-noising Based on Generalized Non-local Means in Non-subsample Shearlet Domain | 221 |
| A Global Routing Algorithm Based on Physical Depth for Abnormal Data in Radar Sensor Networks | 231 |
| Part IV Spectrum Access and Optimization | |
| Carrier Frequency Offset Estimation Based on Compressed Sensing: A Preliminary Study | 245 |
| A Stackelberg Game Spectrum Sharing Scheme in Cognitive Radio-Based Heterogeneous Wireless Sensor Networks Songlin Sun, Na Chen, Junshi Xiao and Tao Tian | 255 |
| Research on Maximal Weighted Independent Set-Based Graph Coloring Spectrum Allocation Algorithm in Cognitive Radio Networks | 263 |
| Hybrid Full-/Half-Duplex Relaying in Cognitive Networks Zhi Lin, Yueming Cai, Weiwei Yang and Wendong Yang | 273 |
| Low-SNR Energy Detection Based on Relevance in Power Density Spectrum | 283 |
| A Comprehensive Framework to Evaluate the Utilization of Spectrum Resource | 293 |
| Part V Interference Alignment | |
| Internetwork Interference Avoidance Mechanism for WBAN Based on Nested-Complex-Superframe Structure | 313 |

xiv Contents

| On Gradient Ascend for Single Data Stream Multifrequency Channel Interference Alignment | 323 |
|--|-----|
| A New Distributed Interference Alignment Technology Scheme Under the Condition of Partial Interference Alignment Weixia Zou, Tiefei Wang and Chao Xu | 331 |
| CFO Estimation with Model-Based CoSaMP Over Flat Fading Channel | 341 |
| Modeling and Analyzing Electromagnetic Interference Signal in Complex Battlefield Environments | 351 |
| Part VI Wireless Communication | |
| An 8-Cycle Construction Scheme for Latin Square LDLC Zhao Dan-feng and Xie Feng | 365 |
| DME Pulse Interference Suppression Based on WRELAX for GPS L5 Signal | 375 |
| Multi-stack Decoding of Polar Codes | 383 |
| STDMA for Inter-satellite Communication in Low Earth Orbit Hailong Kang, Xiujie Jiang and Weiming Xiong | 391 |
| DME Interference Mitigation Algorithm Based on Signal Separation Estimation Theory for GPS L5 Jie Li and Wei Fang | 399 |
| Wireless Video Transmission Optimization Based on Error Resilience and Unequal Packet Loss | 409 |
| A Scheme Against Spectrum Sensing Data Falsification Attacks Based on Improved Energy Detection Algorithm | 423 |
| NOMA Based on User Grouping and Multiple Layer Modulation Sicong Qu, Zhongwei Si, Zhiqiang He and Kai Niu | 431 |

Contents xv

| Part VII Millimeter Wave, UWB and Terahertz Technology | |
|--|-----|
| Performance Analysis and Comparison of CFAR Methods for FOD Detection in Airport Runway Environment | 443 |
| Clutter Simulation for FOD Detection in Airport Runway | |
| Environment | 453 |
| Integrated Narrow Band and UWB Reconfigurable Antenna | 461 |
| On the Spatial Modulation for 60 GHz Millimeter Wave Communications with Nonlinear Distortions | 471 |
| 3D-Beamforming Codebook Design Based on Reduced-Dimension and Decomposition for Millimeter-Wave Communications | 479 |
| An Experimental Low-Complexity Noncoherent Ultra-Wideband Ranging System | 489 |
| The Optimization of Terahertz Collimating Lens | 499 |
| An Improved STFT Approach in Foliage Target Detection of UWB Radar Sensor Networks | 507 |
| Part VIII Localization and Tracking | |
| Effect of Inaccurate Range Measurements on Hybrid TOA/RSS Linear Least Squares Localization | 523 |
| The Real-Time Target Tracking Algorithm Based on Improved Template Matching and its Hardware Implementation | 531 |
| A Novel NLOS Mobile Node Localization Method in Wireless | |
| Sensor Network | 541 |

xvi Contents

| Design and Development of Positioning System of Cable Trench Based on VLC + PLC | 551 |
|---|-----|
| A Novel Solution for the Optimal Deployment of Readers in Passive RFID Location System | 559 |
| Algorithm for Optimal Placement of Cooperative Nodes in 2D TOA Cooperative Localization System | 569 |
| Path Matching Indoor Positioning with WiFi Signal Strength Sheng Su, Haijie Yu and Gaoli Zhang | 577 |
| Part IX Pattern Recognition | |
| Anomaly Detection in Big Data with Separable Compressive Sensing | 589 |
| Ground-Based Cloud Classification Using Pyramid Salient LBP Zhong Zhang, Yue Zhang and Shuang Liu | 595 |
| A Global Fast Fourier Transform Method for Target Recognition Guang Zhu | 603 |
| Ground-based Cloud Detection: A Comprehensive Study Shuang Liu and Zhong Zhang | 611 |
| Scene Text Detection with Adaptively Weighted Descriptors in Opponent Color Space | 619 |
| Learning Representations for Steganalysis from Regularized CNN Model with Auxiliary Tasks | 629 |
| An Adaptive Ensemble Classifier for Steganalysis Based on Dynamic Weighted Fusion | 639 |
| Technology of SCL Configuration File Content Difference Detection | 649 |
| Discrimination of Three-Dimensional Fluorescence Spectra of PAHs Mixture Using Parallel Factor Analysis | 657 |

Contents xvii

| Part X Image and Video Processing | |
|--|-----|
| Signal Sensing with Sub-Nyquist Cyclic Feature Sese Wang, Zhuo Sun, Weichen Zhao, Xuantong Chen and Haiwen Luo | 667 |
| A Novel Image Encryption Algorithm Based on Multiple Chaotic Systems and Self-adaptive Model | 677 |
| Smoggy Environment Recognition by Combining Infrared and Visible Images | 687 |
| Human Eye Detection via Sparse Representation | 693 |
| Infrared and Visible Image Fusion Based on Tetrolet Transform Xin Zhou and Wei Wang | 701 |
| Image Quality Assessment via Adaptive Pooling | 709 |
| Human Abnormal Behavior Detection Based on RGBD Video's Skeleton Information Entropy Ziyang Bian, Tingfa Xu, Chang Su and Xuan Luo | 715 |
| Image Restoration Using the Alternation Direction Method Based on the Gradient Cepstrum Analysis PSF Estimation Strategy | 725 |
| Image Denoising via Modified Multiple-Step Local Wiener Filter and Quaternion Wavelet Transform Xiaobo Zhang | 733 |
| Adaptive Multiscale Block Compressed Sensing with Texture Information and Orientation Estimation | 741 |
| A Robust Tracking Combined with Texture Feature and Background-Weighted Color Histogram | 751 |
| Part XI Biological and Medical Signal Processing | |
| Throat Polyp Detection Based on the KPCA and Neural Network Pattern Recognition | 763 |

xviii Contents

| Dielectric Property Study of Bacillus cereus Spores at Microwave Frequency Region | 773 |
|---|-----|
| Huiyong Shan and Yueming Zuo | |
| Improving Consensus Hierarchical Clustering Framework | 781 |
| Part XII Circuit Processing System and System Design | |
| A Resistor Loaded Bow-Tie Antenna Fed by Gaussian Pulse Jun Zheng, Jia-Wei Li and Ning-Ning Yan | 795 |
| A Cavity-Backed Time-Domain Oval Dipole Antenna Designed for Application in Anti-stealth Radar | 803 |
| Improvement of Errors-and-Erasures Algorithm for JTIDS Zengshan Tian, Liang Li, Mu Zhou and Wei He | 813 |
| An X Band 40 W High Power Amplifier Based on Internally Matched | 823 |
| A Virtualization Testbed Framework for Networked Information System | 833 |
| Fixed-Frequency Sliding Mode Control of Buck Converter Based on Differential Geometry Theory Li Kai, Li Jianbing, Zhou Dongfang and Kai Zheng | 843 |
| The Pre-application System of Real Estate Registration | 851 |
| Research on Testing the Ultrasonic Wind Sensors in Circuit Wind Tunnel | 859 |
| The Experiment and Analysis of Image Acquisition System Based on the Hardware Platform | 869 |
| Kinematics Parameters Identification for IRB 1400 Using Improved Quantum Behaved Particle Swarm Optimization | 881 |
| Research and Design of the Communication Response Among Intelligent Cars | 891 |

Contents xix

| Optimization Parameter System in Hebei Low Voltage Grid Xiao Yang, Nan Wang, Wenping Hu, Liang Meng and Peng Luo | 901 |
|--|------|
| A Study on Micro-Grid Power Quality Management and Simulation Based on RTW Toolkit | 911 |
| Design and Analysis of Coil with Ferrite Core for Wireless Power Transfer Systems | 921 |
| Fiber Bragg Grating Arrays in All-Solid Photonic Bandgap Fiber Tingting Han and Jingping Yang | 929 |
| The Design of Temperature and Humidity Measure Based on USB Interface | 935 |
| The Demodulation System of Fiber Bragg Grating Based on Edge Filter Wenjie Shen, Jing Jiang, Yun Tian and Hao Sun | 943 |
| Part XIII Signal Processing and Machine Learning Algorithm | |
| Convergence and Steady-State Properties of the Affine Projection Mixed-Norm Algorithms Ling Liqian, Lin Bin, Wang Fei and Luo Lingling | 953 |
| A Parameter-Free Gradient Bayesian Two-Action Learning Automaton Scheme | 963 |
| An Adaptive Method of Signal Separation Based on Spatial Filter Biao Cheng, Hong-yi Yu, Zhi-xiang Shen and Yun-peng Hu | 971 |
| Function Optimization via a Continuous Action-Set Reinforcement Learning Automata Model | 981 |
| Quality Test and Track System Based on Neural Network Lu Yao, Zhou Hailiang, Guo Jingtao, Shi Xin and Wang Xigang | 991 |
| A New Vector Measurement Method for Power System Based on All-Phase Fourier Transform | 1007 |

xx Contents

| Comparative Presentation of Machine Learning Algorithms in Flood Prediction Using Spatio-Temporal Data | 1015 |
|---|------|
| Neuro-Space Mapping Method for Nonlinear Device Modeling Shuxia Yan, Jing Jin, Lisen Zhang, Zhihong Feng, Peng Xu and Qijun Zhang | 1025 |
| General Framework for Parameter Learning and Optimization in Stochastic Environments | 1033 |