

# Table of Contents – Part III

## Signal and Image Processing

|  |    |
|--|----|
| Real Time Crowd Counting with Human Detection and Human Tracking . . . . .   | 1  |
| <i>Xinjian Zhang and Liqing Zhang</i>  |    |
| A New Method for Removing Random-Valued Impulse Noise . . . . .  | 9  |
| <i>Qiyu Jin, Li Bai, Jie Yang, Ion Grama, and Quansheng Liu</i>  |    |
| CTR Prediction for DSP with Improved Cube Factorization Model from Historical Bidding Log . . . . .  | 17 |
| <i>Lili Shan, Lei Lin, Di Shao, and Xiaolong Wang</i>  |    |
| Image Retrieval Using a Novel Color Similarity Measurement and Neural Networks . . . . .   | 25 |
| <i>Cheng Yang and Xiaodong Gu</i>  |    |
| Bottom-Up Visual Saliency Using Binary Spectrum of Walsh-Hadamard Transform . . . . .  | 33 |
| <i>Ying Yu, Jie Lin, and Jian Yang</i>   |    |
| Sonification for EEG Frequency Spectrum and EEG-Based Emotion Features . . . . .   | 42 |
| <i>Yuxi Zhang, Yifeng Huang, Junwei Yue, and Liqing Zhang</i>  |    |
| Forecasting Crowd State in Video by an Improved Lattice Boltzmann Model . . . . .  | 50 |
| <i>Ye Tao, Peng Liu, Wei Zhao, and XiangLong Tang</i>  |    |
| Properties of Multiobjective Robust Controller Using Difference Signals and Multiple Competitive Associative Nets in Control of Linear Systems . . . . . | 58 |
| <i>Weicheng Huang, Yuki Ishiguma, and Shuichi Kurogi</i>   |    |
| Calibrating Independent Component Analysis with Laplacian Reference for Real-Time EEG Artifact Removal . . . . .   | 68 |
| <i>Hussein A. Abbass</i>   |    |
| Unsupervised Segmentation Using Cluster Ensembles . . . . .  | 76 |
| <i>Wei Zhang, Jie Yang, Wenjing Jia, Nikola Kasabov, Zhenhong Jia, and Lei Zhou</i>  |    |

|   |     |
|---|-----|
| Similar-Video Retrieval via Learned Exemplars and Time-Warped Alignment .....   | 85  |
| <i>Teruki Horie, Masafumi Moriwaki, Ryota Yokote, Shota Ninomiya, Akihiro Shikano, and Yasuo Matsuyama</i>            |     |
| Automatic Image Annotation Exploiting Textual and Visual Saliency ...   | 95  |
| <i>Yun Gu, Haoyang Xue, Jie Yang, and Zhenhong Jia</i>  |     |
| Classification of Fish Ectoparasite Genus <i>Gyrodactylus</i> SEM Images Using ASM and Complex Network Model .....    | 103 |
| <i>Rozniza Ali, Bo Jiang, Mustafa Man, Amir Hussain, and Bin Luo</i>  |     |
| Linked Tucker2 Decomposition for Flexible Multi-block Data Analysis .....   | 111 |
| <i>Tatsuya Yokota and Andrzej Cichocki</i>  |     |
| Celebrity Face Image Retrieval Using Multiple Features .....  | 119 |
| <i>Jie Jin and Liqing Zhang</i>   |     |
| A Novel Adaptive Shrinkage Threshold on Shearlet Transform for Image Denoising .....                                  | 127 |
| <i>Sheikh Md. Rabiul Islam, Xu Huang, and Kim Le</i>  |     |
| Perception of Symmetry in Natural Images: A Cortical Representation of Shape .....                                    | 135 |
| <i>Ko Sakai, Ken Kurematsu, and Shouhei Matsuoka</i>  |     |
| Image Denoising with Rectified Linear Units .....   | 142 |
| <i>Yangwei Wu, Haohua Zhao, and Liqing Zhang</i>  |     |
| Shape Preserving RGB-D Depth Map Restoration .....  | 150 |
| <i>Wei Liu, Haoyang Xue, Yun Gu, Jie Yang, Qiang Wu, and Zhenhong Jia</i>   |     |
| Online Detection of Concept Drift in Visual Tracking .....  | 159 |
| <i>Yichen Liu and Yue Zhou</i>  |     |
| Temporally Regularized Filters for Common Spatial Patterns by Preserving Locally Linear Structure of EEG Trials ..... | 167 |
| <i>Minmin Cheng, Haixian Wang, Zuhong Lu, and Deji Lu</i>   |     |
| Interactive Color Correction of Display by Dichromatic User .....   | 175 |
| <i>Hiroki Takagi, Hiroaki Kudo, Tetsuya Matsumoto, Yoshinori Takeuchi, and Noboru Ohnishi</i>                         |     |
| A Neural Ensemble Approach for Segmentation and Classification of Road Images .....                                   | 183 |
| <i>Tejy Kinattukara and Brijesh Verma</i>   |     |

|  |     |
|--|-----|
| Using Biologically-Inspired Visual Features to Model the Restorative Potential of Scenes . . . . .                         | 194 |
| <i>James Mountstephens</i>   |     |
| Classification of Stroke Patients' Motor Imagery EEG with Autoencoders in BCI-FES Rehabilitation Training System . . . . . | 202 |
| <i>Mushangshu Chen, Ye Liu, and Liqing Zhang</i>   |     |
| Real-Time Patch-Based Tracking with Occlusion Handling . . . . .   | 210 |
| <i>Jian Tian and Yue Zhou</i>  |     |
| Blood Cell Image Retrieval System Using Color, Shape and Bag of Words . . . . .  | 218 |
| <i>Mohammad Reza Zare and Woo Chaw Seng</i>  |     |
| Analysis of OCT Images for Detection of Choroidal Neovascularization in Retinal Pigment Epithelial Layer . . . . .         | 226 |
| <i>Sadaf Ayaz, Sadaf Sahar, Madeeha Zafar, Muhammad Usman Akram, and Yasser Nadeem</i>                                     |     |
| Online Object Tracking Based on Depth Image with Sparse Coding . . . . .   | 234 |
| <i>Shan-Chun Shen, Wei-Long Zheng, and Bao-Liang Lu</i>  |     |
| Real-Time Compressive Tracking with a Particle Filter Framework . . . . .  | 242 |
| <i>Xuan Yao and Yue Zhou</i>   |     |
| Image Super-Resolution with Fast Approximate Convolutional Sparse Coding . . . . .   | 250 |
| <i>Christian Osendorfer, Hubert Soyer, and Patrick van der Smagt</i>   |     |
| Sparse Coding for Improved Signal-to-Noise Ratio in MRI . . . . .  | 258 |
| <i>Fuleah A. Razzaq, Shady Mohamed, Asim Bhatti, and Saeid Nahavandi</i>   |     |
| Scalable Video Coding Using Hybrid DCT/Wavelets Architectures . . . . .  | 266 |
| <i>Tamer Shanableh</i>   |     |
| Image Enhancement Using Geometric Mean Filter and Gamma Correction for WCE Images . . . . .                                | 276 |
| <i>Shipra Suman, Fawnizu Azmadi Hussin, Aamir Saeed Malik, Nicolas Walter, Khean Lee Goh, Ida Hilmi, and Shiw hooi Ho</i>  |     |
| Autoencoder-Based Collaborative Filtering . . . . .  | 284 |
| <i>Yuanxin Ouyang, Wenqi Liu, Wenge Rong, and Zhang Xiong</i>  |     |
| Extended Laplacian Sparse Coding for Image Categorization . . . . .  | 292 |
| <i>Mouna Dammak, Mahmoud Mejdoub, and Chokri Ben Amar</i>  |     |

**The 2014 Cybersecurity Data Mining Competition and Workshop (CDMC2014)**

|  |     |
|--|-----|
| Stochastic Decision Making in Learning Classifier Systems through a Natural Policy Gradient Method . . . . . | 300 |
| <i>Gang Chen, Mengjie Zhang, Shaoning Pang, and Colin Douch</i>  |     |
| Quantum Inspired Evolutionary Algorithm by Representing Candidate Solution as Normal Distribution . . . . .  | 308 |
| <i>Sreenivas Sremath Tirumala, Gang Chen, and Shaoning Pang</i>  |     |
| Text Categorization with Diversity Random Forests . . . . .  | 317 |
| <i>Chun Yang, Xu-Cheng Yin, and Kaizhu Huang</i>   |     |
| Unknown Attack Detection by Multistage One-Class SVM Focusing on Communication Interval . . . . .            | 325 |
| <i>Shohei Araki, Yukiko Yamaguchi, Hajime Shimada, and Hiroki Takakura</i>                                   |     |
| Analysis and Configuration of Boundary Difference Calculations . . . . .                                     | 333 |
| <i>Simon Dacey, Lei Song, Lei Zhu, and Shaoning Pang</i>   |     |
| Morphological Associative Memory Employing a Split Store Method . . . . .                                    | 341 |
| <i>Hakaru Tamukoh, Kensuke Koga, Hideaki Harada, and Takashi Morie</i>                                       |     |
| A Novel Hybrid Approach for Combining Deep and Traditional Neural Networks . . . . .                         | 349 |
| <i>Rui Zhang, Shufei Zhang, and Kaizhu Huang</i>   |     |
| A Classification Method of Darknet Traffic for Advanced Security Monitoring and Response . . . . .           | 357 |
| <i>Sangjun Ko, Kyuil Kim, Younsu Lee, and Jungsuk Song</i>   |     |
| Detecting Malicious Spam Mails: An Online Machine Learning Approach . . . . .                                | 365 |
| <i>Yuli Dai, Shunsuke Tada, Tao Ban, Junji Nakazato, Jumpei Shimamura, and Seiichi Ozawa</i>                 |     |
| <br><b>Intelligent Systems for Supporting Decision-Making Processes: Theories and Applications</b>           |     |
| Freshness-Aware Thompson Sampling . . . . .  | 373 |
| <i>Djallel Bouneffouf</i>  |     |
| Condition Monitoring of Broken Rotor Bars Using a Hybrid FMM-GA Model . . . . .                              | 381 |
| <i>Manjeevan Seera, Chee Peng Lim, and Chu Kiong Loo</i>   |     |

|   |     |
|---|-----|
| Employing Genetic Algorithm to Construct Epigenetic Tree-Based Features for Enhancer Region Prediction . . . . .            | 390 |
| <i>Pui Kwan Fong, Nung Kion Lee, and Mohd Tajuddin Abdullah</i>   |     |
| Model and Algorithm for Multi-follower Tri-level Hierarchical Decision-Making . . . . .                                     | 398 |
| <i>Jialin Han, Guangquan Zhang, Jie Lu, Yaoguang Hu, and Shuyuan Ma</i>   |     |
| A Fuzzy ART-Based Approach for Estimation of High Performance Concrete Mix Proportion . . . . .                             | 407 |
| <i>Fei Ha Chiew, Kok Chin Chai, Chee Khoon Ng, and Kai Meng Tay</i>   |     |
| A New Application of an Evolving Tree to Failure Mode and Effect Analysis Methodology . . . . .                             | 415 |
| <i>Wui Lee Chang, Kai Meng Tay, and Chee Peng Lim</i>   |     |
| An Application of Fuzzy Adaptive Resonance Theory to Engineering Education . . . . .  | 423 |
| <i>See Hung Lau, Kai Meng Tay, and Chee Khoon Ng</i>  |     |
| Augmented Query Strategies for Active Learning in Stream Data Mining . . . . .  | 431 |
| <i>Mustafa Amir Faisal, Zeyar Aung, Wei Lee Woon, and Davor Svetinovic</i>  |     |
| Feature Selection and Mass Classification Using Particle Swarm Optimization and Support Vector Machine . . . . .            | 439 |
| <i>Man To Wong, Xiangjian He, Wei-Chang Yeh, Zaidah Ibrahim, and Yuk Ying Chung</i>   |     |
| Strategic Decision Support in Waste Management Systems by State Reduction in FCM Models . . . . .                           | 447 |
| <i>Miklós F. Hatwágner, Adrienn Buruzs, Péter Földesi, and László T. Kóczy</i>  |     |
| An ELM Based Multi Agent Systems Using Certified Belief in Strength . . . . .   | 458 |
| <i>Chong Tak Yaw, Keem Siah Yap, Hwa Jen Yap, and Ungku Anisa Ungku Amirulddin</i>  |     |
| Constrained–Optimization-Based Bayesian Posterior Probability Extreme Learning Machine for Pattern Classification . . . . . | 466 |
| <i>Shen Yuong Wong, Keem Siah Yap, and Hwa Jen Yap</i>  |     |

## Neuroengineering and Neuralcomputing

|  |     |
|--|-----|
| Adaptive Translational Cueing Motion Algorithm Using Fuzzy Based Tilt Coordination . . . . .                       | 474 |
| <i>Houshyar Asadi, Arash Mohammadi, Shady Mohamed, and Saeid Nahavandi</i>   |     |
| Adaptive Washout Algorithm Based Fuzzy Tuning for Improving Human Perception . . . . .                             | 483 |
| <i>Houshyar Asadi, Arash Mohammadi, Shady Mohamed, Delpak Rahim Zadeh, and Saeid Nahavandi</i>                     |     |
| Neurophysiology of Insects Using Microelectrode Arrays: Current Trends and Future Prospects . . . . .              | 493 |
| <i>Julie Gaburro, Jean-Bernard Duchemin, Asim Bhatti, Peter Walker, and Saeid Nahavandi</i>                        |     |
| Neuron's Spikes Noise Level Classification Using Hidden Markov Models . . . . .                                    | 501 |
| <i>Sherif Haggag, Shady Mohamed, Asim Bhatti, Hussein Haggag, and Saeid Nahavandi</i>                              |     |
| Improved Robust Kalman Filtering for Uncertain Systems with Missing Measurements . . . . .                         | 509 |
| <i>Hossein Rezaei, Shady Mohamed, Reza Mahboobi Esfanjani, and Saeid Nahavandi</i>                                 |     |
| Motor Imagery Data Classification for BCI Application Using Wavelet Packet Feature Extraction . . . . .            | 519 |
| <i>Imali Thanuja Hettiarachchi, Thanh Thi Nguyen, and Saeid Nahavandi</i>  |     |
| Adaptive-Multi-Reference Least Means Squares Filter . . . . .  | 527 |
| <i>Luke Nyhof, Imali Hettiarachchi, Shady Mohammed, and Saeid Nahavandi</i>  |     |
| sEMG-Based Single-Joint Active Training with iLeg—A Horizontal Exoskeleton for Lower Limb Rehabilitation . . . . . | 535 |
| <i>Jin Hu, Zeng-Guang Hou, Liang Peng, Long Peng, and Nong Gu</i>  |     |

## Cognitive Robotics

|   |     |
|---|-----|
| Find Rooms for Improvement: Towards Semi-automatic Labeling of Occupancy Grid Maps . . . . .                  | 543 |
| <i>Sven Hellbach, Marian Himstedt, Frank Bahrmann, Martin Riedel, Thomas Villmann, and Hans-Joachim Böhme</i> |     |

|   |     |
|---|-----|
| Understanding Dynamic Environments with Fuzzy Perception . . . . .  | 553 |
| <i>Frank Bahrmann, Sven Hellbach, Sabrina Keil,<br/>and Hans-Joachim Böhme</i>  |     |
| Towards Real-World Neurorobotics: Integrated Neuromorphic Visual<br>Attention . . . . .   | 563 |
| <i>Samantha V. Adams, Alexander D. Rast, Cameron Patterson,<br/>Francesco Galluppi, Kevin Brohan, José-Antonio Pérez-Carrasco,<br/>Thomas Wennekers, Steve Furber, and Angelo Cangelosi</i> |     |
| On the Role of Working Memory in Trading-Off Skills and Situation<br>Awareness in Sudoku . . . . .  | 571 |
| <i>George Leu, Jiangjun Tang, and Hussein Abbass</i>  |     |
| GA-Tetris Bot: Evolving a Better Tetris Gameplay Using Adaptive<br>Evaluation Scheme . . . . .  | 579 |
| <i>Somnuk Phon-Amnuaisuk</i>  |     |
| An Effectiveness of Model-Based Development with User Model in<br>Consideration of Human . . . . .  | 587 |
| <i>Yoshinobu Akimoto, Eri Sato-Shimokawara, Yasunari Fujimoto,<br/>and Toru Yamaguchi</i>   |     |
| Dynamic Programming for Guided Gene Transfer in Bacterial Memetic<br>Algorithm. . . . .   | 596 |
| <i>Tiong Yew Tang, Simon Egerton, János Botzheim, and<br/>Naoyuki Kubota</i>  |     |
| Topological Gaussian Adaptive Resonance Associative Memory with<br>Fuzzy Motion Planning for Place Navigation . . . . .   | 604 |
| <i>Wei Hong Chin and Chu Kiong Loo</i>  |     |
| <b>Security in Signal Processing and Machine Learning</b>   |     |
| Anomaly Based Intrusion Detection through Temporal Classification . . .   | 612 |
| <i>Shih Yin Ooi, Shing Chiang Tan, and Wooi Ping Cheah</i>  |     |
| Threshold Visual Secret Sharing Based on Boolean Operations and<br>Random Grids . . . . .   | 620 |
| <i>Xuehu Yan, Shen Wang, and Xiamu Niu</i>  |     |
| Wavelet Based SDA for Face Recognition . . . . .  | 628 |
| <i>Goh Fan Ling, Pang Ying Han, Liew Yee Ping, Ooi Shih Yin,<br/>and Loo Chu Kiong</i>  |     |
| Essential Visual Cryptographic Scheme with Different Importance of<br>Shares . . . . .  | 636 |
| <i>Xuehu Yan, Shen Wang, Xiamu Niu, and Ching-Nung Yang</i>   |     |

Improved Biohashing Method Based on Most Intensive Histogram  
Block Location ..... 644  
*Munalih Ahmad Syarif, Thian Song Ong, Andrew Beng Jin Teoh,  
and Connie Tee*

2.5D Face Recognition under Tensor Manifold Metrics ..... 653  
*Lee-Ying Chong, Andrew Beng Jin Teoh, Thian-Song Ong,  
and Siew-Chin Chong*

**Learning Systems for Social Network and Web  
Mining**

Predicting Mobile Subscriber’s Behaviour from Contextual Information  
Extraction: SMS Data ..... 661  
*Ayesha Javed Butt, Naveed Anwer Butt, Rabia Ghias Butt,  
and Muhammad Touseef Ikram*

Discovering Plain-Text-Described Services Based on Ontology  
Learning ..... 673  
*Hai Dong, Farookh Khadeer Hussain, and Athman Bouguettaya*

A Fuzzy VSM-Based Approach for Semantic Service Retrieval ..... 682  
*Supannada Chotipant, Farookh Khadeer Hussain, Hai Dong,  
and Omar Khadeer Hussain*

Maintaining Trust in Cloud Computing through SLA Monitoring ..... 690  
*Walayat Hussain, Farookh Khadeer Hussain,  
and Omar Khadeer Hussain*

**Author Index** ..... 699