Table of Contents

The First Section: Biomedical Signal Processing, Imaging, and Visualization	
A Preprocessing Method of EEG Based on EMD-ICA in BCI Banghua Yang, Liangfei He, Qian Wang, Chunting Song, and Yunyuan Zhang	1
Real-Time 3D Microtubule Gliding Simulation	13
Research on Novel Optimization SIFT Algorithm Based Fast Mosaic Method	23
Investigation of Mental Fatigue Induced by a Continuous Mental Arithmetic Task Based on EEG Coherence Analysis	33
An Automatic Pulmonary Nodules Detection Method Using 3D Adaptive Template Matching	39
A 3D Adaptive Template Matching Algorithm for Brain Tumor Detection	50
Influence of Conduit Angles on Hemodynamics of Modified Blalock-Taussig Shunt: Computational Analysis of Patient-Specific Virtual Procedures	62
Method for Detecting Gaze Direction Based on Eyes Moving Trend Qijie Zhao, Hui Shao, Xudong Zhang, and Dawei Tu	72
Gait Pose Estimation Based on Manifold Learning Fan Zhao, Shiwei Ma, Zhonghua Hao, and Jiarui Wen	82
Method of CT Pulmonary Vessel Image Enhancement Based on Structure Tensor	91



Sheng-Dong Nie

An Improved Orthogonal Matching Pursuit Algorithm for Signal Reconstruction in Wireless Body Sensor Network	101
Calibration Method of Stereo Microscope Based on Depth Correction Yigang Wang, Gangyi Jiang, Mei Yu, and Shengli Fan	109
A Prediction Model of Rectum's Perceptive Function Reconstruction Based on SVM Optimized by ACO	121
A New Polynomial Hybrid Reflection Model Based on Perspective Projection	129
The Second Section: Computational Methods and Intelligence in Modeling Genetic and Chemical Networks and Regulation	
An Improved Bayesian-Based Wavelet Package Denoising Method for Data Reconciliation to Coking Chemical Process	137
Colored Petri Nets-Based Biological Network Reconstruction for Systems Biology	150
Online Anomaly Detection Method Based on BBO Ensemble Pruning in Wireless Sensor Networks	160
The Third Section: Computational Methods and Intelligence in Organism Modeling	
The Hemodynamic Comparison of Different Carotid Artery Bifurcation Angles Based on Patient-Specific Models	170
Design and Implementation of a Plant Morphology Modeling System Based on Evolutionary Strategy	178

The Fourth Section: Computational Methods and Intelligence in Modeling and Design of Synthetic Biological Systems	
Numerical Simulation of the Nutrient Limitation in the Yangtze River	188
Estuary Hao Liu, Wen-Shan Xu, Hong-Xuan Kang, Bao-Shu Yin, and De-Zhou Yang	
Dynamic Analysis of Circular Engineered Cardiac Tissue to Evaluate the Active Contractile Force	198
Real-Time Hand Gesture Recognition for Robot Hand Interface Xiaomeng Lv, Yulin Xu, and Ming Wang	209
The Fifth Section: Computational Methods and Intelligence in Biomechanical Systems, Tissue Engineering and Clinical Bioengineering	
The Application of Computational Chemistry and Chemometrics to Developing a Method for Online Monitoring of Polymer Degradation in the Manufacture of Bioresorbable Medical Implants	215
Modeling and Simulation of the Neural Control on OSAS with Fluid-Structural Interaction Method	226
The Sixth Section: Intelligent Medical Apparatus and Clinical Applications	
Circulation System Modelling with National Implantable Ventricular Assist Device (NIVAD): Hydrodynamic Characters, Hemolysis Test in Vitro and Animal Experiments	234
Fused Visualization for Large-Scale Blood Flow Dataset	246

The Seventh Section: Modeling and Simulation of Societies and Collective Behaviour	
The Research on Agent-Based Simulation Oriented to Emergency Management	256
A Research on Human Cognitive Modeling in Rumor Spreading Based on HTM	268
Knowledge Based Modeling Method of Artificial Society Oriented to Emergency Management	278
A Kinetic Modeling for Radiotherapy Mechanisms with Gene- Environment Network (GEN) Framework	288
The Eighth Section: Innovative Education in Systems Modeling and Simulation	
Identification of MIMO Neuro-fuzzy Hammerstein Model with Noises Li Jia, Xunlong Li, and Min-Sen Chiu	298
A Virtual Training and Evaluation Platform for Electric Wheelchair Drivers	307
Research of Damage Imaging Algorithm in Plate Based on Signal Magnitude	319
DES Algorithm Realization in Asynchronous Circuit Using Four-Phase Bundled-Data	329
Integrated Neurofuzzy-JITL Model and Its Application in Batch Processes	339
The Ninth Section: Data Analysis and Data Mining of Biosignals	
MongoDB Improves Big Data Analysis Performance on Electric Health Record System	350

Table of Contents	ΧV
The Tenth Section: Feature Selection	
Survey of Multi-sensor Image Fusion	358
An Novel Quality Classification for Ring Die Pellet	368
Stereo Matching for Binocular Underwater Images Using SURF Operator and Epipolar Restriction	378
Seedling Image Segmentation and Feature Extraction under Complicated Background	387
The Eleventh Section: Robust Optimization and Data Analysis	
Survey of Indoor Positioning Technologies and Systems	400
Robust H_{∞} Control for Discrete-Time Systems with Uncertain Packet Dropouts Probabilities	410
Effect of Environment on Prey-Predator Systems with Numerical Simulation	420
Author Index	425

•