Contents

Part I  Wearable Sensors

The Design of E Glove Hand Function Evaluation Device Based on Fusion of Vision and Touch ............................ 3
Jing Guo, Cui-lian Zhao, Yu Li, Lin-hui Luo and Kun-feng Zhang

An Emotion Recognition System Based on Physiological Signals Obtained by Wearable Sensors ................................. 15
Cheng He, Yun-jin Yao and Xue-song Ye

Integrated Application Research About the Necklace Type Wearable Health Sensing System Under the Internet of Things ................ 27
Jian-jun Yu and Xing-bin Chen

A Multi-scale Flexible Tactile-Pressure Sensor ..................... 49
Xiao-zhou Lü

Design of a Wearable Thermoelectric Generator for Harvesting Human Body Energy ................................. 55
Haiyan Liu, Yancheng Wang, Deqing Mei, Yaoguang Shi and Zichen Chen

Three-Axis Contact Force Measurement of a Flexible Tactile Sensor Array for Hand Grasping Applications .................. 67
Yancheng Wang, Kailun Xi, Deqing Mei, Zhihao Xin and Zichen Chen

A Novel Silicon Based Tactile Sensor with Fluid Encapsulated in the Cover Layer for Prosthetic Hand ......................... 81
Ping Yu, Chun-xin Gu, Wei-ting Liu and Xin Fu

An Adaptive Feature Extraction and Classification Method of Motion Imagery EEG Based on Virtual Reality .................. 93
Li Wang, Huiqun Fu, Xiu-feng Zhang, Rong Yang, Ning Zhang and Fengling Ma
One-Handed Wearable sEMG Sensor for Myoelectric Control of Prosthetic Hands .................................................. 105
Yin-lai Jiang, Shintaro Sakoda, Masami Togane, Soichiro Morishita
and Hiroshi Yokoi

Wearable Indoor Pedestrian Navigation Based on MIMU
and Hypothesis Testing ........................................ 111
Xiao-fei Ma, Zhong Su, Xu Zhao, Fu-chao Liu and Chao Li

Calibration Method of the 3-D Laser Sensor Measurement System . . . 123
Qing-Xu Meng, Qi-Jie Zhao, Da-Wei Tu and Jin-Gang Yi

Part II Wearable Robots

Study on a Novel Wearable Exoskeleton Hand Function Training
System Based on EMG Triggering ............................. 135
Wu-jing Cao, Jie Hu, Zhen-ping Wang, Lu-lu Wang
and Hong-liu Yu

Dynamic Analysis and Design of Lower Extremity Power-Assisted
Exoskeleton .................................................. 145
Shengli Song, Xinglong Zhang, Qing Li, Husheng Fang, Qing Ye
and Zhitao Tan

Human Gait Trajectory Learning Using Online Gaussian
Process for Assistive Lower Limb Exoskeleton ............... 165
Yi Long, Zhi-jiang Du, Wei Dong and Wei-dong Wang

Research on Bionic Mechanism of Shoulder Joint Rehabilitation
Movement .................................................. 181
Guo-xin Pan, Hui-qun Fu, Xiu-feng Zhang and Feng-ling Ma

Reducing the Human-Exoskeleton Interaction Force Using Bionic
Design of Joints ......................................... 195
Wei Yang, Canjun Yang, Qianshao Wei and Minhang Zhu

Development of a Lower Limb Rehabilitation Wheelchair System
Based on Tele-Doctor–Patient Interaction ....................... 211
Shuang Chen, Fang-fa Fu, Qiao-ling Meng and Hong-liu Yu

A Grasp Strategy with Flexible Contacting for Multi-fingered
Hand Rehabilitation Exoskeleton ........................... 225
Qian-xiao Wei, Can-jun Yang, Qian Bi and Wei Yang

Unscented Transform-Based Correlation Between Surrogate
and Tumor Motion in Robotic Radiosurgery .................... 239
Shu-mei Yu, Feng-feng Zhang, Meng Dou, Rong-chuan Sun
and Li-ning Sun
A Pulmonary Rehabilitation Training Robot for Chronic Obstructive Pulmonary Disease Patient ............................................... 251
Zhi-hua Zhu, Tao Liu, Bo Cong and Fengping Liu

Research and Development for Upper Limb Amputee Training System Based on EEG and VR ........................................ 263
Jian Li, Hui-qun Fu, Xiu-feng Zhang, Feng-ling Ma, Teng-yu Zhang,
Guo-xin Pan and Jing Tao

Evaluation on Measurement Uncertainty of Sensor Plating Thickness ................................................................. 275
Xu-cheng Rong and Jian-jun Yu

Research on the Stability of Needle Insertion Force ............ 283
Qiang Li and De-dong Gao

The Metabolic Cost of Walking with a Passive Lower Limb Assistive Device ...................................................... 301
Jean-Paul Martin and Qingguo Li

Part III Advanced Control System

A Novel Method for Bending Stiffness of Umbilical Based on Nonlinear Large Deformation Theory ......................... 309
Zuan Lin, Lei Zhang and Can-jun Yang

Silicon Micro-gyroscope Closed-Loop Correction and Frequency Tuning Control ....................................................... 321
Xingjun Wang, Bo Yang, Bo Dai, Yunpeng Deng and Di Hu

Autofocus for Enhanced Measurement Accuracy of a Machine Vision System for Robotic Drilling .............................. 333
Biao Mei, Wei-dong Zhu and Ying-lin Ke

A New Scene Segmentation Method Based on Color Information for Mobile Robot in Indoor Environment ................ 353
Xu-dong Zhang, Qi-Jie Zhao, Qing-XU Meng, Da-Wei Tu and Jin-Gang Yi

Dynamic Hopping Height Control of Single-Legged Hopping Robot ...... 365
Zhi-wei Chen, Bo Jin, Shi-qiang Zhu, Yun-tian Pang and Gang Chen

The Stability Analysis of Quadrotor Unmanned Aerial Vehicles .................. 383
Yun-ping Liu, Xian-ying Li, Tian-miao Wang, Yong-hong Zhang and Ping Mei
Hand Exoskeleton Control for Cerebrum Plasticity Training
Based on Brain–Computer Interface ..................................... 395
Qian Bi, Canjun Yang, Wei Yang, Jinchang Fan
and Hansong Wang

Lateral Balance Recovery of Quadruped Robot
on Rough Terrains .................................................. 411
Guo-liang Yuan, Shao-yuan Li, He-sheng Wang
and Dan Huang

Research on the Application of NoSQL Database in Intelligent
Manufacturing .......................................................... 423
Chuan-hong Zhou, Kun Yao, Zhen-yang Jiang and Wu-xia Bai

Design and Application of Auditory Evoked EEG Processing
Platform Based on Matlab ........................................... 435
Rong Yang, Hui-qun Fu, Xiu-feng Zhang, Li Wang, Ning Zhang
and Feng-ling Ma

Part IV Visual Recognition Application

An Efficient Detection Method for Text of Arbitrary Orientations
in Natural Images .................................................. 447
Lanfang Dong, Zhongdi Chao and Jianfu Wang

Research of a Framework for Flow Objects Detection and Tracking
in Video ............................................................... 461
Lanfang Dong, Jiakui Yu, Jianfu Wang and Weinan Gao

A Kinect-Based Motion Capture Method for Assessment
of Lower Extremity Exoskeleton .................................... 481
Min-hang Zhu, Can-jun Yang, Wei Yang and Qian Bi

Table Tennis Service Umpiring System Based on Video
Identification—for Height and Angle of the Throwing Ball .... 495
Yun-feng Ji, Chao-li Wang, Zhi-hao Shi, Jie Ren and Ling Zhu

Visual Servo-Based Control of Mobile Robots for Opening Doors .... 511
Xiao-mei Ma, Chao-li Wang and Lei Cao

Control of Two-Wheel Self-balancing Robots Based on Gesture
Recognition ........................................................... 525
Jie-han Liu, Lei Cao and Chao-li Wang

An Extended Kalman Filter-Based Robot Pose Estimation Approach
with Vision and Odometry ........................................... 539
Xue-bo Zhang, Cong-yuan Wang, Yong-chun Fang and Ke-xin Xing
Visual Servoing of a New Designed Inspection Robot for Autonomous Transmission Line Grasping ........................................ 553 Tao He, He-sheng Wang, Wei-dong Chen and Wei-jie Wang

A Novel Design of Laser In-Frame Robot for Electron Cyber Scalpel Therapy and Its Rotary Joint ........................................ 571 Jian-jun Yuan, Xi Chen, Chang-guang Tang and Kazuhisa Nakajima

Index ................................................................. 585
Wearable Sensors and Robots
Proceedings of the International Conference on Wearable Sensors and Robots 2015
Yang, C.; Virk, G.S.; Yang, H. (Eds.)
2017, XI, 587 p. 367 illus., 242 illus. in color., Hardcover
ISBN: 978-981-10-2403-0