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IFIP was founded in 1960 under the auspices of UNESCO, following the First World Computer Congress held in Paris the previous year. An umbrella organization for societies working in information processing, IFIP's aim is two-fold: to support information processing within its member countries and to encourage technology transfer to developing nations. As its mission statement clearly states,

IFIP's mission is to be the leading, truly international, apolitical organization which encourages and assists in the development, exploitation and application of information technology for the benefit of all people.

IFIP is a non-profitmaking organization, run almost solely by 2500 volunteers. It operates through a number of technical committees, which organize events and publications. IFIP's events range from an international congress to local seminars, but the most important are:

- The IFIP World Computer Congress, held every second year;
- Open conferences;
- Working conferences.

The flagship event is the IFIP World Computer Congress, at which both invited and contributed papers are presented. Contributed papers are rigorously refereed and the rejection rate is high.

As with the Congress, participation in the open conferences is open to all and papers may be invited or submitted. Again, submitted papers are stringently refereed.

The working conferences are structured differently. They are usually run by a working group and attendance is small and by invitation only. Their purpose is to create an atmosphere conducive to innovation and development. Refereeing is also rigorous and papers are subjected to extensive group discussion.

Publications arising from IFIP events vary. The papers presented at the IFIP World Computer Congress and at open conferences are published as conference proceedings, while the results of the working conferences are often published as collections of selected and edited papers.

Any national society whose primary activity is about information processing may apply to become a full member of IFIP, although full membership is restricted to one society per country. Full members are entitled to vote at the annual General Assembly, National societies preferring a less committed involvement may apply for associate or corresponding membership. Associate members enjoy the same benefits as full members, but without voting rights. Corresponding members are not represented in IFIP bodies. Affiliated membership is open to non-national societies, and individual and honorary membership schemes are also offered.

Daoliang Li Yingyi Chen (Eds.)

Computer and Computing Technologies in Agriculture VII

7th IFIP WG 5.14 International Conference, CCTA 2013
Beijing, China, September 18-20, 2013
Revised Selected Papers, Part I

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Preface

First of all, I must express my sincere thanks to all authors who submitted research papers to support the 7th International Conference on Computer and Computing Technologies in Agriculture (CCTA2013) held in Beijing, China, during September 18–20, 2013.

The conference was hosted by the China Agricultural University; the IFIP TC5 Work Group (WG) on Advanced Information Processing for Agriculture (AIPA); the Agricultural Engineering Information Committee, Chinese Society of Agricultural Engineering. It was organized by the China-EU Centre for Information & Communication Technologies (CICTA).

Proper scale management is not only a necessary approach for agro-modernization and agro-industrialization but it is also required for the development of agricultural productivity. Thus, the application of different technologies in agriculture has become especially important and “informatized agriculture” and the “Internet of Things” have been sought out by many countries recently in order to scientifically manage agriculture so as to achieve low costs and high income. CICTA aims at boosting research on advanced and practical technologies applied in agriculture and promoting international communication and cooperation, and has successfully held seven international conferences since 2007.

The topics of CCTA2013 cover a wide range of interesting theory and applications of all kinds of technology in agriculture, including: the Internet of things and cloud computing; simulation models and decision-support systems for agricultural production; smart sensor, monitoring, and control technology; traceability and e-commerce technology; computer vision, computer graphics, and virtual reality; the application of information and communication technology in agriculture; and universal information service technology and service system development in rural areas.

We selected the 115 best papers among all those submitted to CCTA2013 for these proceedings, and all the papers are divided into two thematic sections. In this volume, creative thoughts and inspirations could be discovered, discussed and disseminated. It is always exciting to have experts, professionals, and scholars getting together with creative contributions to share inspiring ideas and hopefully accomplish great developments in these technologies of high demand.

Finally, I would like to express my sincere thanks to all the authors, speakers, session chairs, and attendees, both local and international for their active participation and support of this conference.

January 2014

Daoliang Li
Chair of CCTA2013

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- China Agricultural University
- The IFIP TC5 Work Group (WG) on Advanced Information Processing for Agriculture (AIPA)
- Agricultural Engineering Information Committee, Chinese Society of Agricultural Engineering

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Table of Contents – Part I

The Application Study of Electronic Farming in the Ecology Construction in Chinese Tropical Area	1
<i>Meng Meng, Xiaofei Zheng, and Jiabin Wang</i>	
Developments on Informatization Technology in Agricultural Operations in China	10
<i>Qiuping Zhou and Guohua Fu</i>	
The Parameter Optimization and Performance Analysis of the Suspension System in the Cab of a Heavy Truck	16
<i>Jihai Gu, Hui Wang, Chengwen Wang, Ming Pang, and Xiangyang Jin</i>	
Evolution of Growing Season Precipitation Series in the West Region of Heilongjiang Province Based on Wavelet Analysis	25
<i>Wensheng Zheng, Sijia Shi, and Zhenping Gong</i>	
The Matching Research of Strawberry Diseases Image Features Based on KD-Tree Search Method	32
<i>Jianshu Chen, Jianlun Wang, Shuting Wang, and Hao Liu</i>	
Research on Automatic Irrigation Algorithm of Strawberry Greenhouse Based on PLC	41
<i>Jianlun Wang, Shuting Wang, Jianshu Chen, Hao Liu, and Dongbo Xu</i>	
A Dynamic Knowledge Models of Nitrogen Fertilizer and Computer System for Cotton	52
<i>ChunJing Si</i>	
Research and Design of One Webpage System for Each Village in Shandong Province	61
<i>Wenjie Feng, Huaijun Ruan, Yan Tang, Wenxiang Zhao, Qingfu Kong, and Fengyun Wang</i>	
Simulation Study of Winter Wheat Photosynthate Distribution Effect on Controlled Water and Fertilizer Measure	69
<i>Yan Li, Yang-ren Wang, and Shuhong Sun</i>	
Secure Gateway of Internet of Things Based on AppWeb and Secure Sockets Layer for Intelligent Granary Management System	78
<i>Rong Tao, Senbin Yang, Wei Tan, and Changqing Zhang</i>	
Feature Based Hole Filling Algorithm on Triangular Mesh	90
<i>Bin Xu, Zhongke Li, and Ying Tan</i>	

Design and Implementation of Aquarium Remote Automation Monitoring and Control System	102
<i>Yinchi Ma and Wen Ding</i>	
Study on Conditional Autoregressive Model of Per Capita Grain Possession in Yellow River Delta	109
<i>Yujian Yang, Huaijun Ruan, Yan Tang, Wenxiang Zhao, and Xueqin Tong</i>	
Agent-Based Simulation of Rural Areas and Agriculture Information of 11 Country Units in Shandong Province	117
<i>Yujian Yang, Lili Wang, Qingyu Chen, and Jingling Li</i>	
Influence of Digital Computer Technology on Architectural Design Teaching Mode	123
<i>Huang Ting and Jiang Sicheng</i>	
Optimization Design on Deep-Fertilization Fertilizer Amount Adjusting Mechanism for Paddy Field	128
<i>Jinfeng Wang, Detang Zou, Jinwu Wang, and Xinlun Yang</i>	
Testing and Analysis of the Shear Modulus of Urea Granules	137
<i>Jinfeng Wang, Detang Zou, Jinwu Wang, and Wei Zhou</i>	
Analysis and Evaluation the Websites of Agridata Base on Link Analysis	145
<i>Jian Wang and Ding-feng Wu</i>	
Discussion on Fruiter Professional Information Service Mode of Shandong Province	152
<i>Zhi-jun Wang, Meng Jiang, and Shu-han Cheng</i>	
The Application of Image Retrieval Technology in the Prevention of Diseases and Pests in Fruit Trees	160
<i>Zhi-jun Wang, Xin Liu, Meng Jiang, and Shu-han Cheng</i>	
Advances in the Application of Image Processing Fruit Grading	168
<i>Chengjun Fang and Chunjian Hua</i>	
Using Memcached to Promote Unified User Management System	175
<i>Zuliang Zhao, Xiaodong Zhang, Lin Li, Zhe Liu, De-Hai Zhu, and Shao-Ming Li</i>	
A Growth Measuring Approach for Maize Based on Computer Vision ...	183
<i>Chuanyu Wang, Boxiang Xiao, Xinyu Guo, and Sheng Wu</i>	
The Comprehensive Assessment of Planting Elements Based on Analytic Hierarchy Process	190
<i>Yujian Yang, Huaijun Ruan, Jingling Li, and Lei Wang</i>	

The Monitoring of Rare Earths Mining from the Gannan Area of Southern China Using Remote Sensing Technology	197
<i>Baoying Ye, Zhenghui Chen, Nisha Bao, and Ying Li</i>	
A Survey on Farmland Crop Information Acquisition	206
<i>Danqin Yi and Haiyan Ji</i>	
Self-tuning PID-type Fuzzy Adaptive Control for CRAC in Datacenters	215
<i>Junwen Deng, Liu Yang, Xinrong Cheng, and Wu Liu</i>	
Spatio-temporal Variability Analysis of Soil Volumetric Moisture Content on the Field Scale	226
<i>Xueqin Tong, Yujian Yang, and Wei Dong</i>	
Taxonomy of Source Code Security Defects Based on Three-Dimension- Tree	232
<i>Yan Zhang, Guowei Dong, Tao Guo, and Jianyu Yang</i>	
Path Recognition for Agricultural Robot Vision Navigation under Weed Environment	242
<i>Peidong Wang, Zhijun Meng, ChangHai Luo, and Hebo Mei</i>	
Application of LS-SVM and Variable Selection Methods on Predicting SSC of Nanfeng Mandarin Fruit	249
<i>Tong Sun, Wenli Xu, Tian Hu, and Muhua Liu</i>	
A Novel Robust Method for Automatic Detection of Traffic Sign	263
<i>Bo Peng and Juan Wu</i>	
The Vulnerability Assessment Method for Beijing Agricultural Drought	269
<i>Lingmiao Huang, Peiling Yang, and Shumei Ren</i>	
Application of Modbus Protocol Based on μC /TCPIP in Water Saving Irrigation in Facility Agricultural	281
<i>Jin-lei Li, Wen-gang Zheng, Chang-jun Shen, and Ke-wu Wang</i>	
The Soil Heavy Metal Information Accurate Collection and Evaluation about <i>Lycium Barbarum</i> Cultivation in Western China	289
<i>Ming Xiao, Wenjun Yang, Ze Zhang, Xianglin Tang, Xin Lv, and Dezhao Chi</i>	
Research on the Optimization of Agricultural Supply Chain Based on Internet of Things	300
<i>Guangsheng Zhang</i>	
Measurement and Study on Drying Shrinkage Characteristic of Tobacco Lamina Based on Computer Vision	306
<i>Wenkui Zhu, Zhaogai Wang, Delong Xu, and Jinsong Du</i>	

Research of PID Algorithm for Valve Controlled Hydraulic Motor Variable Rate Fertilizer Control System	315
<i>Chunying Liang, Xi Wang, Jianwei Ji, Qianhui Xu, and Peng Lü</i>	
OAPRS: An Online Agriculture Prescription Recommendation System	327
<i>Qingtian Zeng, Zhichao Liang, Weijian Ni, and Hua Duan</i>	
Study of Rice Identification during Early Season Using Multi-polarization TerraSAR-X Data	337
<i>Lin Guo, Zhiyuan Pei, Shangjie Ma, Juanying Sun, and Jiali Shang</i>	
Color Image Segmentation in RGB Color Space Based on Color Saliency	348
<i>Chen Zhang, Wenzhu Yang, Zhaohai Liu, Daoliang Li, Yingyi Chen, and Zhenbo Li</i>	
Water-Landscape-Ecological Relationship and the Optimized Irrigation Strategy for Green-Roof Plants in Beijing, a Case Study for <i>Euonymus japonicus</i>	358
<i>Caiyuan Wang, Peiling Yang, Yunkai Li, and Shumei Ren</i>	
Design and Implementation of Agro-technical Extension Information System Based on Cloud Storage	371
<i>Leifeng Guo, Wensheng Wang, Yong Yang, and Zhiguo Sun</i>	
Analyzing Thermal Infrared Image Characteristics of Maize Seedling Stage	380
<i>Zilong Chen, Dazhou Zhu, Xiangrong Ren, Hua Cong, Cheng Wang, and Chunjiang Zhao</i>	
Modeling Design and Application of Low-Temperature Plasma Treatment Test Stand for Seeds before Sowing	393
<i>Changyong Shao, Yong You, Guanghui Wang, Zhiqin Wang, Yan Li, Lijing Zhao, Xin Tang, Liangdong Liu, and Decheng Wang</i>	
Research on Rapid Identification Method of Buckwheat Varieties by Near-Infrared Spectroscopy Technique	401
<i>Fenghua Wang, Ju Yang, Zhiyong Xi, and Hailong Zhu</i>	
The Characteristic of Hyperspectral Image of Wheat Seeds during Sprouting	408
<i>Jiayu Chen, Honghui Chen, Xiaodong Wang, Chunhua Yu, Cheng Wang, and Dazhou Zhu</i>	
Control Software Design of Plant Microscopic Ion Flow Detection Motion Device	422
<i>Lulu He, Fubin Jiang, Dazhou Zhu, Peichen Hou, Baozhu Yang, Cheng Wang, and Jiuwen Zhang</i>	

Interactive Information Service Technology of Tea Industry Based on Demand-Driven	434
<i>Xiaohui Shi and Tian'en Chen</i>	
Design and Development of Intelligent Monitoring System for Plastic Tea Greenhouse	443
<i>Fengyun Wang, Jiye Zheng, Lin Mei, Zhaotang Ding, Wenjie Feng, and Lei Wang</i>	
Research on the Method of Simulating Knowledge Structure of the Information Searchers — Illustrated by the Case of Pomology Information Retrieval	450
<i>Ding-feng Wu, Guo-min Zhou, Jian Wang, and Jian Wang</i>	
Strategies for High Yield Inferred through Path Analysis of Major Economical Traits in Yongyou 8, a Hybrid Late Season Japonica Rice	458
<i>Weiming Liu, Enguo Wang, Shanyou Huang, and Xianbiao He</i>	
Mathematical Modeling and Optimization of Schemes of Major Agronomic Factors for Hybrid Rice ‘Yongyou 17’	464
<i>Weiming Liu and Zuda Bao</i>	
Segmentation of Small Animal Computed Tomography Images Using Original CT Values and Converted Grayscale Values	470
<i>Guoqiang Ma, Naixiang Li, and Xiaojuan Wang</i>	
Design and Implementation of Laiwu Black Information Management System Based on ExtJS	478
<i>Dong Chen, Pingzeng Liu, Yunfan Zhang, and Hongjian Ma</i>	
Fresh Tea Picking Robot Based on DSP	486
<i>Heng Li, Chao Li, Liming Xu, Guangming Qin, Xin Lu, and Ying Zhao</i>	
Study on Cloud Service Mode of Agricultural Information Institutions	497
<i>Xiaorong Yang, Neng-fu Xie, Dan Wang, and Li-hua Jiang</i>	
Impact of Simulated Irrigation with Treated Wastewater and Saline- Sodic Solutions on Soil Hydraulic Conductivity, Pores Distribution and Fractal Dimension	502
<i>Fangze Shang, Shumei Ren, Tian Zou, Peiling Yang, and Nuan Sun</i>	
Author Index	517

Table of Contents – Part II

Maize Seed Embryo and Position Inspection Based on Image Processing	1
<i>Yingbiao Wang, Liming Xu, Xueguan Zhao, and Xingjie Hou</i>	
Greenhouse Irrigation Optimization Decision Support System.....	10
<i>Dongmei Zhang, Ping Guo, Xiao Liu, Jinliang Chen, and Chong Jiang</i>	
Study on Pear Diseases Query System Based on Ontology and SWRL.....	24
<i>Qian Sun and Yong Liang</i>	
Applications and Implementation of Decomposition Storage Model (DSM) in Paas of Agricultural.....	34
<i>Shuwen Jiang, Tian'en Chen, Jing Dong, and Cong Wang</i>	
Estimation of Pig Weight by Machine Vision: A Review.....	42
<i>Zhuo Li, Cheng Luo, Guanghui Teng, and Tonghai Liu</i>	
Agricultural Field Environment High-Quality Image Remote Acquisition.....	50
<i>Junqian Fu, Deqin Xiao, and Xiaohui Deng</i>	
Study on Consultative Agricultural Knowledge Service System.....	61
<i>Xiguang Wang</i>	
Stochastic Simulation and Application of Monthly Rainfall and Evaporation.....	70
<i>Nana Han and Yang-ren Wang</i>	
Elimination Method Study of Ambiguous Words in Chinese Automatic Indexing	79
<i>Dan Wang, Xiaorong Yang, and Jie Zhang</i>	
Analysis and Evaluation of Soil Fertility Status Based on Weighted K-means Clustering Algorithm.....	89
<i>Guifen Chen, Lixia Cai, Hang Chen, Liying Cao, and Chunan Li</i>	
Effect of Website Quality Factors on the Success of Agricultural Products B2C E-commerce.....	98
<i>Ping Yu and Dongmei Zhao</i>	
Importance of Information Systems in the Evaluation and Research of Nutrition and Health of Key Groups in China's Rural Areas.....	114
<i>Liqun Guo, Bo Peng, and Zhenxiang Huang</i>	

The Classification of Pavement Crack Image Based on Beamlet Algorithm.....	129
<i>Aiguo Ouyang, Qin Dong, Yaping Wang, and Yande Liu</i>	
Research on the Construction and Implementation of Soil Fertility Knowledge Based on Ontology.....	138
<i>Li Ma, Helong Yu, Guifen Chen, Liying Cao, and Yue Wang</i>	
Virtual Prototype Design of Double Disc Mower Drive Bracket Based on ANSYS Workbench	145
<i>Ning Zhang, Manquan Zhao, Yanhua Shi, and Yueqin Liu</i>	
Research on 3G Terminal-Based Agricultural Information Service	152
<i>Neng-fu Xie and Xuefu Zhang</i>	
Study on Semantic Heterogeneity Elimination of Agricultural Product Price Information in Multi-source Network	158
<i>Jing Zhang, Guo-min Zhou, Jian Wang, Jie Zhang, and Fangli Xie</i>	
Study on the Application of Information Technologies on Suitability Evaluation Analysis in Agriculture	165
<i>Ying Yu, Leigang Shi, Heju Huai, and Cunjun Li</i>	
Research of the Early Warning Analysis of Crop Diseases and Insect Pests	177
<i>Dengwei Wang, Tian'en Chen, and Jing Dong</i>	
Study on the Way of Production, Life and Thinking of Farmers in Mobile Internet Era	188
<i>Yong Yang, Wensheng Wang, Leifeng Guo, Zhiguo Sun, and Xiufeng Li</i>	
Studies on Domestic and Overseas in Research Progress of Agricultural Information Technologies	198
<i>Ying Yu, Cunjun Li, Leigang Shi, Heju Huai, and Xiangyang Qin</i>	
Research and Design of Peanut Diseases Diagnosis and Prevention Expert System.....	212
<i>Kun Zhang, Benjing Zhu, Fengzhen Liu, and Yongshan Wan</i>	
Filling Holes in Triangular Meshes of Plant Organs.....	222
<i>Zhihui Sun, Xinyu Guo, Shenglian Lu, Weiliang Wen, and Youjia Chen</i>	
Semantic-Based Reasoning for Vegetable Supply Chain Knowledge Retrieval.....	232
<i>Xinyu Liu, Lifan Hou, and Yonghao Wang</i>	

Spectral Characteristics of Tobacco Cultivars with Different Nitrogen Efficiency and Its Relationship with Nitrogen Use	239
<i>Taibo Liang, Jianwei Wang, Yanling Zhang, Jiaqin Xi, Hanping Zhou, Baolin Wang, and Qisheng Yin</i>	
Research on Agricultural Products Cold-Chain Logistics of Mobile Services Application	247
<i>Congcong Chen, Tian'en Chen, Chi Zhang, and Guozhen Xie</i>	
The WSN Real-Time Monitoring System for Agricultural Products Cold-Chain Logistics	255
<i>Chen Liu, Ruirui Zhang, Tian'en Chen, and Tongchuan Yi</i>	
The Construction of Agricultural Products Traceability System Based on the Internet of Things—The Cases of Pollution-Free Vegetables in Leping of Jiangxi Province	262
<i>Fang Yang</i>	
Key Technologies and Algorithms' Application in Agricultural Food Supply Chain Tracking System in E-commerce	269
<i>Lijuan Huang and Pan Liu</i>	
Evaluation of EPIC Model of Soil NO ₃ -N in Irrigated and Wheat-Maize Rotation Field on the Loess Plateau of China	282
<i>Xuechun Wang, Shishun Tao, Jun Li, and Yongjun Chen</i>	
Three-Dimensional Reconstruction and Characteristics Computation of Corn Ears Based on Machine Vision	290
<i>Jianjun Du, Xinyu Guo, Chuanyu Wang, Sheng Wu, and Boxiang Xiao</i>	
Application of RMAN Backup Technology in the Agricultural Products Wholesale Market System	301
<i>Ping Yu and Nan Zhou</i>	
Effects of Water and Nutrition on Photoassimilates Partitioning Coefficient Variation	309
<i>Jianhua Jin and Yang-ren Wang</i>	
Effect of Water and Nitrogen Stresses on Correlation among Winter Wheat Organs	316
<i>Xin-yang Zhou and Yang-ren Wang</i>	
Application of a Logical Reasoning Approach Based Petri Net in Agriculture Expert System	326
<i>Xia Geng, Yong Liang, and Qiulan Wu</i>	
Fermentation Condition Optimization for Endophytic Fungus BS002 Isolated from <i>Sophora Flavescens</i> by Response Surface Methodology	342
<i>Na Yu and Lu He</i>	

Daily Sales Forecasting for Grapes by Support Vector Machine	351
<i>Qian Wen, Weisong Mu, Li Sun, Su Hua, and Zhijian Zhou</i>	
Research on Text Mining Based on Domain Ontology	361
<i>Li-hua Jiang, Neng-fu Xie, and Hong-bin Zhang</i>	
Accuracy Loss Analysis in the Process of Cultivated Land Quality Data Gridding	370
<i>Lingling Sang, De-Hai Zhu, Chao Zhang, and Wenju Yun</i>	
Research and Application of Variable Rate Fertilizer Applicator System Based on a DC Motor	381
<i>Honglei Jia, Xianzhen Feng, Jiangtao Qi, Xinhui Liu, Chunxi Liu, Yongxi Yang, and Yang Li</i>	
Brief Probe into the Key Factors that Influence Beijing Agricultural Drought Vulnerability	392
<i>Lingmiao Huang, Peiling Yang, and Shumei Ren</i>	
Chinese Web Content Extraction Based on Naïve Bayes Model	404
<i>Jinbo Wang, Lianzhi Wang, Wanlin Gao, Jian Yu, and Yuntao Cui</i>	
Research on the Vegetable Trade Current Situation and Its Trade Competitiveness in China	414
<i>Shasha Li</i>	
A Fault Data Capture Method for Water Quality Monitoring Equipment Based on Structural Pattern Recognition	423
<i>Hao Yang, Daoliang Li, and Yong Liang</i>	
The Analysis of County Science and Technology Worker Internet Usage and Its Influence Factors	434
<i>Huiping Chen, Zhihong Tian, Yubin Wang, and Xue Han</i>	
A Smart Multi-parameter Sensor with Online Monitoring for the Aquaculture in China	444
<i>Fa Peng, Jinxing Wang, Shuangxi Liu, Daoliang Li, Dan Xu, and Yang Wang</i>	
An Intelligent Ammonia Sensor for Livestock Breeding Monitoring	453
<i>Yang Wang, Zetian Fu, Lingxian Zhang, Xinxing Li, Dan Xu, Lihua Zeng, Juncheng Ma, and Fa Peng</i>	
Research on the Knowledge Based Parameterized CAD System of Wheat and Rice Combine Chassis	461
<i>Xingzhen Xu, Shuangxi Liu, Weishi Cao, Peng Fa, Xianxi Liu, and Jinxing Wang</i>	
An Intelligent Search Engine for Agricultural Disease Prescription	469
<i>Weijian Ni, Mei Liu, Qingtian Zeng, and Tong Liu</i>	

Design of Animal Myocardial Contractile Force Detection System Based on Tissue Engineering	478
<i>Guiqing Xi, Ke Han, Ming Zhao, Caojun Huang, and Feng Tan</i>	
Analysis of Airflow Field of Toss Device of Yellow Corn Forage Harvester	486
<i>Yan Huang, Manquan Zhao, and Hantao Liu</i>	
A GPRS-Based Low Energy Consumption Remote Terminal Unit for Aquaculture Water Quality Monitoring	492
<i>Dan Xu, Daoliang Li, Biaoqing Fei, Yang Wang, and Fa Peng</i>	
The Model for the Agricultural Informationalization Benefit Analysis ...	504
<i>Lifeng Shen, Xiaoqing Yuan, and Daoliang Li</i>	
Strategic Optimal Path and Developmental Environment on Photovoltaic Industry in China Based on an AHP-SWOT Hybrid Model	513
<i>Yiding Zhang and Songyi Dian</i>	
Design of the Unmanned Area Fetching Trolley	523
<i>Xuelun Hu, Licai Zhang, Yaoguang Wei, and Yingyi Chen</i>	
Intelligent Ammonia-Nitrogen Sensor Which Based on Ammonia Electrode	534
<i>Fan Zhang, Yaoguang Wei, Yingyi Chen, and Chunhong Liu</i>	
Dissolved Oxygen Prediction Model Which Based on Fuzzy Neural Network	544
<i>Yalin Liu, Yaoguang Wei, and Yingyi Chen</i>	
Flexible Embedded Telemetry System for Agriculture and Aquaculture	552
<i>André Weiskopf, Frank Weichert, Norbert Fränzel, and Manuel Schneider</i>	
Author Index	561