## **Table of Contents**

**Preface, Committees and Sponsors** 

## **Chapter 1: Robot Design, Motion Planning and Robot Control**

<b>Design of a Master Manipulator with Dynamical Simplification for Master-Slave Robot</b> L.N. Zhang, S.X. Wang, J.M. Li and J.H. Li	3
Parameter Self-Adjusting Path Tracking Algorithm of Mobile Robots H.J. Zhang and Y.Y. Ge	10
Global Path Planning for Mobile Robot Based on Improved Ant Colony Algorithms M. Huang, P. Ding and J.X. Huan	15
A Study of Robot Platform Based on WiFi Remote Control Y.Z. Yang, C.S. Ai and K. Lee	20
Fire Detection System Based-On Mobile Robots K.L. Su, J.H. Guo, C.Y. Chung and C.Y. Chung	25
Phase Plane Analysis of Battery Series Balancing on Robot Y.C. Chang, S. Chen and C.C. Chen	29
The Research of Use Database to Build Data String in Robots Y.L. Li and C.C. Kao	34
Measurement of Backlash and Fatigue Wear of PEEK Bush in Robot Joint under Middle Load	
H. Koike, K. Itakura, S. Okazaki, M. Takamiya, K. Kanemasu and K. Kida	38
Facility of Humanoid Robot Control via the Isosceles Triangle Method J.S. Sheu, H.N. Shou and C.K. Lin	44
Motion Planning of the Mobile Robot Using Laser Detection System J.H. Guo, B.Y. Li, S.P. Lin and K.L. Su	48
The Study on the Emotion Factor Extraction from Korean SMS (Short Message Service)	
Text for Robot Service D.Y. Choi, J.K. Park and Y.J. Kim	52
Chapter 2: System of Automation, Control and Measurement	
Chapter 2: System of Automation, Control and Measurement  Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu	59
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller	59 63
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC	63
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC  J.Z. Zhong, W.Y. Li and Y. Yang	
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System H.F. Zhang, X.B. Chen and X.P. Ma	63
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC  J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System	63 70
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System H.F. Zhang, X.B. Chen and X.P. Ma  Enhancing Tower Crane Safety Using Condition Monitoring System	63 70 74
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System H.F. Zhang, X.B. Chen and X.P. Ma  Enhancing Tower Crane Safety Using Condition Monitoring System N.Q. Zhang, M. Yu, X. Zhang, J. Fu and H.S. Wu  Chaos Control for a 4D Hyperchaotic System	63 70 74 80
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC  J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System  H.F. Zhang, X.B. Chen and X.P. Ma  Enhancing Tower Crane Safety Using Condition Monitoring System  N.Q. Zhang, M. Yu, X. Zhang, J. Fu and H.S. Wu  Chaos Control for a 4D Hyperchaotic System  C.J. Xu and P.L. Li  Sliding-Mode Fuzzy Control Using in a Double-Axial Pump-Controlled Folding Machine  R.H. Wong  Parametric Design of Coupled Adaptive Self-Organizing Sliding-Mode Fuzzy Controller in a Valve-Controlled Folding Machine	63 70 74 80 84 88
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC  J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System  H.F. Zhang, X.B. Chen and X.P. Ma  Enhancing Tower Crane Safety Using Condition Monitoring System  N.Q. Zhang, M. Yu, X. Zhang, J. Fu and H.S. Wu  Chaos Control for a 4D Hyperchaotic System  C.J. Xu and P.L. Li  Sliding-Mode Fuzzy Control Using in a Double-Axial Pump-Controlled Folding Machine R.H. Wong  Parametric Design of Coupled Adaptive Self-Organizing Sliding-Mode Fuzzy Controller in	63 70 74 80 84
Cloud Computing and Mobile Audit Tracking-Using Intelligent Cell Phone as Controller Z.P. Ho and S.P. Wu  The Development of Embedded System for Energy Saving in Electro-Hydraulic System S. Patchim and W. Po-Ngaen  Design of Control System of Annealing Tin Machine Based on PLC  J.Z. Zhong, W.Y. Li and Y. Yang  The Design and Implementation of Water Meter Auto Calibration System  H.F. Zhang, X.B. Chen and X.P. Ma  Enhancing Tower Crane Safety Using Condition Monitoring System  N.Q. Zhang, M. Yu, X. Zhang, J. Fu and H.S. Wu  Chaos Control for a 4D Hyperchaotic System  C.J. Xu and P.L. Li  Sliding-Mode Fuzzy Control Using in a Double-Axial Pump-Controlled Folding Machine  R.H. Wong  Parametric Design of Coupled Adaptive Self-Organizing Sliding-Mode Fuzzy Controller in a Valve-Controlled Folding Machine  R.H. Wong  Hybrid Fuzzy-Sliding Control with Fuzzy Self-Tuning for Vector Controlled Drive Systems	63 70 74 80 84 88

Mobile Device Monitoring System in the Plant by an Innovative Approach K.Y. Lian, S.J. Hsiao, W.T. Sung and J.H. Chen	104
Intelligent Environmental Monitoring and Automation System J.H. Chen, W.T. Sung, H.C. Wang and C.Y. Chung	108
MOF Synthesis Heating Process Control System Research J.H. Chen, W.T. Sung and H.C. Wang	112
Control Language for Public - An Example Based on 328eforth W.F. Huang and C.L. Shen	116
Single Camera for Multiple Vehicles License Plate Localization and Recognition on Multilane Highway	120
H.L. Tseng, C.N. Hung, S.Y. Tan, C.C. Tuan, C.P. Lee and W.T. Huang  Environment Supervisory Control of Computer Room Based on Android Device	120 124
S.C. Tung, W.J. Li, K.C. Lee and J.C. Lin  The Development and Design of a Laser Detection System for Tire Thickness Measurement K.S. Lee	124
Design and Experimental Study of a 3-DOF Parallel Swivel Head D. Wang, J.Z. Guo, R. Fan and W.Y. Chen	132
An Optimal Study of a Gripper Compliant Mechanism Based on Fuzzy-Taguchi Method T.P. Dao and S.C. Huang	141
Human Detection Algorithm by Meanshift Based on Depth Map Q. Tian, B. Zhou, T. Guo and Y. Wei	145
Application of Improved Dows Fire and Explosion Index (F&EI) for Organic Solvent Recovery Plant	1.40
M. Zhang and W.H. Song <b>Application of the Non-Destructive Testing Method to Determine the G</b> <sub>max</sub> <b>of Bangkok Clay</b> K. Piriyakul	149 157
Application of Piezoelectric Film to Measure the Shear Wave Velocity K. Piriyakul	161
K. I Hlydrai	101
Chapter 3: Manufacturing and Industry Engineering	101
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism	101
Chapter 3: Manufacturing and Industry Engineering	167
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001	
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001  K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling	167
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001  K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling  P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II	167 172
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001  K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling  P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II  L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews  Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid	167 172 180 187
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001  K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling  P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II  L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews  Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid  L. Xu, L. Zhao, M.B. Xu, J. Xu and X. Wang	167 172 180
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001  K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling  P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II  L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews  Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid	167 172 180 187
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001 K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid L. Xu, L. Zhao, M.B. Xu, J. Xu and X. Wang  The Effect of Holes in the Compression Behavior and Energy Absorption of Aluminum Alloy AA7005 Tube S. Bade, C. Lakshmana Rao and K. Srinivas  BP Neural Network and its Improved Algorithm in the Power System Transformer Fault Diagnosis	167 172 180 187 191
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001 K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid L. Xu, L. Zhao, M.B. Xu, J. Xu and X. Wang  The Effect of Holes in the Compression Behavior and Energy Absorption of Aluminum Alloy AA7005 Tube S. Bade, C. Lakshmana Rao and K. Srinivas  BP Neural Network and its Improved Algorithm in the Power System Transformer Fault Diagnosis H.Q. Zhang	167 172 180 187
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001 K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid L. Xu, L. Zhao, M.B. Xu, J. Xu and X. Wang  The Effect of Holes in the Compression Behavior and Energy Absorption of Aluminum Alloy AA7005 Tube S. Bade, C. Lakshmana Rao and K. Srinivas  BP Neural Network and its Improved Algorithm in the Power System Transformer Fault Diagnosis	167 172 180 187 191
Chapter 3: Manufacturing and Industry Engineering  Specification of Forces in Hydraulic Cylinders for Lifting and Transporting Mechanism HR3001 K. Monkova and P. Monka  Development of Load System for High-Speed Railway Rolling P. Chen, B.Q. Fan, M. Su, J. Wang and X.P. Ouyang  An Optimization Method for Geometric Error of Machine Tool Based on NSGA-II L.G. Cai, C. Zhang, Q. Cheng, P.H. Gu and H.Y. Wang  The Latest Progress of Intelligent Manufacturing Reviews Z.H. Zhu and B.Y. Wang  Lab Investigations into High Temperature High Pressure Rheology of Water-Based Drilling Fluid L. Xu, L. Zhao, M.B. Xu, J. Xu and X. Wang  The Effect of Holes in the Compression Behavior and Energy Absorption of Aluminum Alloy AA7005 Tube S. Bade, C. Lakshmana Rao and K. Srinivas  BP Neural Network and its Improved Algorithm in the Power System Transformer Fault Diagnosis H.Q. Zhang  Effect of Rotation Speeds on Friction Coefficients of PPS Race-PTFE Retainer Hybrid Polymer Thrust Bearings under Dry Contact	167 172 180 187 191 196 200

## **Chapter 4: Information System, Data Processing and Network Application**

Electronic Cam Trajectory Generation Algorithm Based on Global Optimal Control Points of Non-Uniform B-Spline	
S.H. Wang, J.H. Hu, Y.K. Wang, Z. Jun, X.F. Qin, S.H. Wu, J.Z. Chang and H.S. Sun	219
Parameter Optimization of Servo Drivers and Controller for CNC Machine Tools Based on Grey Relational Approach J.Y. Chen and W.T. Lin	225
Networked Connection of NC Machine Tools Based on MTConnect T. Che and R.L. Liu	229
A New Resolution about Calculating Degree of Freedom Planar Mechanism with Higher	
Pairs Z.N. Jia, C.Z. Hao, X.Y. Liu and L. Wang	234
The Study of CIGS Absorption Layer Grown by Two-Step Growth Method for Thin-Film Solar Cell	
L.Z. Hsieh, X.M. Duan and M.J. Jeng	238
Dynamic and Analysis of a Marine Stabilization Table M.P. Huynh and S.C. Huang	242
Analysis of Cold Preforming Process for Hollow Fasteners with Thin Flange T.P. Chang, S.C. Huang, T.F. Huang and T.P. Dao	246
Integrated Wireless Value-Added Kitchen Appliances Based on ZigBee Link Technology for	
Eco Smart Home H.C. Hsu and R.C. Lo	250
IPs Design of FPGA for High-Resolution Image Process W.T. Hunag, C.N. Huang, S.Y. Tan, C.C. Tuan, C.H. Chen and X.B. Wang	257
Design of Embedded Streaming Media Server Based on Python H.F. Zhang and X.C. Fang	261
Mathematical Models for the Dynamics Simulation of Tuberculosis C.Y. Chung, H.Y. Chung and W.T. Sung	265
Study on the Characteristic of Sensitive Load under Voltage Sags R.H. Liu, A.Q. Pan, H.B. Wang and X. Yang	269