# Table of Contents

## Preface

Conference Organization

Program Committee

Keynotes

---

## Robot System Design and Path Planning

Head Following Control Method of a Mobile Continuum Robot for Deep-Cavity Inspection

---

Te Li, Kuo Liu, Haibo Liu, Jiali Zhang, and Yongqing Wang

---

Sliding Mode Control of Three-Links Spatial Robot Based on Low-Pass Filter

---

Fei Hu, Feng Chen, and Muhan Yu

---

Kinematic Analysis and Trajectory Planning for Serial Robot in Hazardous Biochemical Treatment

---

Zhuo Chen, Weihua Su, Bin Li, Hang Wu, Baozhen Liu, and Xiaoli Qin

---

Trajectory Tracking Control of WMR Based on Sliding Mode Disturbance Observer with Unknown Skidding and Slipping

---

Ye Jinhua, Yang Suzhen, and Jin Xiao

---

Calibration Method and Simulation of Kinematic Parameters for Light-Weight Robot Based on Flexible Error Analysis

---

Gang Chen, Lei Wang, Qingxuan Jia, and Shiwei Wang

---

An Improved Obstacle Avoidance Method for Robot Based on Constraint of Obstacle Boundary Condition

---

Haitian Xie, Jiawei Gao, Lin Zuo, Changhua Zhang, and Luan Chen

---

Motion Planning of Automatic Press Line with Hybrid Type Transferring Robot

---

Shihan Ma and Baochen Wei
Optimal Trajectory Planning for Delta Robot Based on Three-Parameter Lamé Curve ..........................................................................................................................................................39
  Weidi Chen, Honggen Fang, Yang Yang, and Wensong He

Mechanism Design and Analysis for an Automatical Reconfiguration Cable-Driven Parallel Robot ..........................................................................................................................................................................................45
  Tiantian Chen, Sen Qian, Yongchang Li, and Zeqiang Yin

Impedance Control of Robots: An Overview .......................................................................................................................51
  Peng Song, Yueqing Yu, and Xuping Zhang

Process Simulation and Optimization of Ammunition Filling Robot Based on DELMIA .................................................................................................................................................56
  Meng Yin, Xinxing Lv, Yun He, and Zhigang Xu

Control Theory and Electrical Engineering

Robust Control of Boost Converter .............................................................................................................................................61
  Lijie Qi and Maosen Xiao

An Efficient Fuzzy Alarm System for Improving Human Performance in Supervisory Task ..........................................................................................................................................................................................66
  Cheng-Li Liu and Shiaw-Tsyr Uang

Design of a Two-Point-Contact Fingertip Tactile Force Feedback Device ...............................................................................71
  Zhen Zhang, Adiljan Yimit, Xin Lu, and Yoshihiro Hagihara

Strong Tracking Current Statistical Model Based on Mixed Bayesian-Fisher Model ..........................................................................................................................................................................................................75
  Shouliang Bao, Shuiying Cheng, and Chengcheng Xu

Vibration Analysis of U-Shaped Beam Electrothermal Microactuators ..................................................................................80
  Zhuo Zhang, Yueqing Yu, and Xuping Zhang

PMSM Servo Control System Design Based on Fuzzy PID .................................................................................................85
  Guo Qiang, Han Junfeng, and Peng Wei

Sensorless Control of Three-Phase Permanent Magnet Synchronous Motor Based on Fundamental Wave Mathematical Model ..........................................................................................................................................................................................89
  Shi Chen Xing and Wang Chen

Lyapunov Function Based Control Strategy for Hybrid Active Power Filter ........................................................................94
  Bin Zhang, Yu-Xia Li, Xiao-Xia Yang, Yang Liu, Xi-Feng Guo, and Jing-Yi Chen

Research on Multiresponse Robust Optimization Based on RSM ........................................................................................101
  Wu Yang Dong

Design of Repetitive Controller Based on Linear Auto Disturbance Rejection Control for Active Magnetic Bearing Spindles ................................................................................................................................................................................................106
  Dapeng Wang and Hao Sun
An Intelligent Control Method for Influencing Factors of the Spinning Quality and Its Application .................................................................111
  Shao Jingfeng, Yang Xiaoyu, and Ma Chuangtao

Electronic Information Technology and Applications
Distributed Average Consensus with Event-Triggered in Multi-agent Systems under General Directed Topology ..........................................................116
  Xiasheng Shi, Sumian Song, Yuandong Wang, and Gangfeng Yan
FPGA IP Cores of Concurrent Filter for OTDR-distributed Fiber Optic Sensors .................................................................121
  Qiwu Wang, Gangyang Nan, Yang Zhao, and Yang Ju
A Movable Indoor Air Quality Monitoring System ..................................................................................126
  Liu Peng, Fu Danni, Jiang Shengqian, and Wang Mingjie
Adaptive FEC Allocation Algorithm for Wireless Video Transmission .................................................................130
  Kexiong Liu, Xuan Zhang, and Yufei Dou
Analysis of CGF Entity’s Behavior Based on Personality Characteristics ..................................................134
  Wen Chuanhua, Du Wei, Zhu Jiang, Zhang Guoning, and Shen Shoulin

Industrial Automation and Applications
Structure and Design of Microgrippers: A Survey ........................................................................139
  Yatao Zhang, Yueqing Yu, Zhuo Zhang, and Xuping Zhang
Automatic Locating System of Clean-Up Locomotive Based on PLC .................................................................144
  Hui Xu, Ke-jie Zhao, Yi-dan Ning, Hua Yan, and Xin-sheng Che
Research on Fast Measurement Method of Borehole Trajectory Based on Fiber Optic Gyro MWD System ..............................................................................149
  Gao Shuang, Wu Pan, and Li Ling-ling
Manufacture Equipment Retrofit to Allow Usage in the Industry 4.0 .................................................................155
  Diego Hernandez Arjoni, Fernando Silveira Madani, Guilherme Ikeda, Gustavo de M. Carvalho, Loredana B. Cobianchi, Luiz F. L. R. Ferreira, and Emilia Villani
Revit-Based Automation Modeling for Intermediate Railway Station .................................................................162
  Bashar Abdal Noor, SiRong Yi, and Syed Hasnain Alam Kazmi
Investigation into Ergonomics in Ladder of the Hard Sleeper Using JACK .................................................................167
  Zhang Yong and Xu Ping
Ergonomic Aspect and Design of Hand Tools in Ceramic Industry Using JACK .................................................................171
  Xu Ping Zhi Yu
The Method of Pipeline Geometry Deformation Detection Identification Based on Laser Imaging ..........................................................175
  Li-jian Yang, Meng-jun Xu, Song-wei Gao, Bin Liu, and Hao Geng

Human-Eye Tracking and Location Algorithm Based on AdaBoost-STC and RF ..................................................................................180
  Lintao Liu, Jun Liu, and Ziqiang Huang

Design of the Image Acquisition and Processing System for Color Sorter Based on FPGA ........................................................................184
  Hongwei Dong, Yajun Zhang, Mengmei Chen, and Wei Jin

Classification of EEG Signal Based on HCSP and Fuzzy Entropy .................................................................................................189
  Muhan Yu, Feng Chen, and Fei Hu

A Signal Processing Algorithm Based Upon the Weighted Morphological Undecimated Wavelet Decomposition ........................................194
  Wen Yang, Jian Sun, Zhuang Chang, Yongjie Zou, and Wen Zhou

Model in Frequency-Domain Identification of a Fast Steering Mirror System Based on Levenberg-Marquardt Algorithm ........................199
  Chen Peng and Liang Yanbing

Development of a Hybrid Arm Prosthesis Controlled by EEG Signals .........................................................................................203
  Anderson Harayashiki Moreira, Felipe Settanni Misiuk Barbosa, Guilherme Hiroji Anraku Ikeda, Gustavo de Melo Carvalho, Fernando Silveira Madani, and Luis Gonzaga Trabasso

Author Index ..........................................................................................................................................................................................208