

Table of Contents

Preface, Committees and Sponsors

Chapter 1: Advanced Materials Engineering and Technologies

A Cyclic Plasticity Model for Advanced Light Metal Alloys K.I. Kourousis	3
The Effect of Bath Ph on the Phase Formation of Ternary Co-Ni-Fe Nano-Coatings N.A. Resali, K.M. Hyie, W.N.R. Abdullah, M.A.A. Ghani and A. Kalam	9
Finite Element Simulation of Titanium Alloy Turning Process C.J. Yin, Q.C. Zheng and Y.H. Hu	14
The Role of Hydroxide Ions in the Synthesis of Ni Nanoparticles Using High Temperature Polyol Method N.R. Nik Roselina, A. Aziz, K.M. Hyie, C.M. Mardziah, A. Kalam, N.H. Saad and Z. Salleh	18
Indentation Size Effect (ISE) of Vickers Hardness in Steels: Correlation with H/E I.N. Budiarsa	23
Reduction of Metal Contents in Coal Stockpile Wastewater Using Electrocoagulation R. Bow, S. Arita, E. Ibrahim and N. Ngudiantoro	29
Controlling the Nanostructural Characteristics of TiO₂ Nanoparticles Derived from Ilmenite Mineral of Bangka Island through Sulfuric Acid Route H. Latifa, A.H. Yuwono, F. Firdiyono, N.T. Rochman, S. Harjanto and B. Suharno	34
Utilization of Albizia Wood (<i>Albizia falcata</i>) and Ramie Fibers as Wind Turbine Propeller Modification of NACA 4415 Standard Airfoil Sudarsono, Purwanto, J.W. Soedarsono and B. Munir	41
Experimental Investigation and Mathematical Modelling for Surface Roughness of Drilling on GFRP Composites S. Manickam Shanmugasundram, L. Damodhiran, A. Veluchamy, V. Kathirvel and V. Thirugnanam	46
Characterization of Activated Carbon from Oil Palm Shell Prepared by H₃PO₄ for Procion Red Dye Removal P.L. Hariani, M. Faizal, Ridwan, Marsi and D. Setiabudidaya	51
Evaluation from First Principles the Structural Stability of Mg Containing Different Amounts of Al Atoms under High Pressure Q.X. Liu, R.J. Zhang, D.P. Lu and A. Atrens	56
An Experimental Study on the Particle Concentration and Size Distribution of Smoke Generated by Flaming N-Heptane Y.D. Li, D. Chen, F. Wang, W. Yuan, Q.X. Zhang and Y.M. Zhang	61

Chapter 2: General Mechanical Engineering

Research on Car Weighting Test System D.M. Zhang and H.J. Liu	69
Study on Engagement Features for a Novel Spherical Engine Z.Z. Zhang, C.Y. Pan, X.J. Xu, Q. Xie and Y.F. Feng	72
A Research of Short Trip Based on Driving Cycle M. Shi, R.J. Wan and K.X. Wei	77
A Caculation Method of Wave-Maker Mechanical Parameters Based on Matlab and Excel S.J. Wang and L.B. Yang	82
Ecological Research of Ownership Drive Train in the Real Traffic with the Engine Parameters Registration M. Bajerlein, J. Merkisz and P. Daszkiewicz	86
Effects of Palm Biodiesel Blends on Fuel Consumption in Fire Tube Boiler L.N. Komariah, S. Arita, S. Novia, S.S. Wirawan and M. Yazid	93

Chapter 3: Mechanical Design Technology and Modern Design Technologies

Research on Lifting Technology of Engine Hood for Protecting the Head of Pedestrian B.F. Zhang, Q.K. Wei and J.W. Li	101
Based on VERICUT Software Simulation of Multi-Axis Processing Cylindrical Cam Research X.H. Niu, Z.T. Zhang, X.L. Meng, Z.F. Yang and Y. Liu	105
Research on Simulation of Kinematics and Dynamics for Planner Six-Bar Mechanism Based on MATLAB/Simulink Z.Q. Li	109
Second Order Recurrent Neural Network for the Inverse Kinematics of Redundant Manipulators R.S. Hao	114
Time Efficient Testing of Hybrid Electric Vehicles Using Automated Identified Physical Model Structures A. Albers, A. Schwarz, R. Hettel and M. Behrendt	118
Training Equipment Design for Repairing Aircraft Fuel System Based on CAN Bus J.H. Song, Z. Wang and X.D. Zhu	123
Solder Short Reject Reduction in Soft Solder Die Attach (SSD) Process Using Mechanical Solder Shield Design A.A. Rashid, K.Y. Yow, S. Nor Hayati and R.W. Freddawati	127
Design and Static Analysis of an Addendum Modified Helical Gear Tooth V. Balambica, T.J. Prabhu, R. Venkateshbabu and E.V. Deepak	132
Optimization Design of Connecting Rod in Twin-Rotor Cylinder-Embedded Piston Engine H. Chen, C.Y. Pan, H.J. Xu, X. Zhang, T.G. Zou and L. Zhang	139
The Effect of Nose Bluntness and Forebody Strakes on Aerodynamic Characteristics of Air-Launched Rocket Model Y.H. Zhang, H.X. Li, D.C. Zhang and L. Qu	143
Research of Hard Fault Diagnosis Simulation Platform of Aero-Engine's Key Sensors Based on Neural Network Z.R. Sun, Y.G. Sun and C.L.S. Sun	150
The Structural Design of Medical Water-Jet Transmission System and Kinematics Simulation of Cam Mechanism L.T. Cao, X.Z. Zhang, C.H. Shi, S.B. Fu and S.J. Wang	155
Analysis and Optimizing Utility of the Ultra Supercritical Steam Turbine Shaft Vibration K. Pang, H.C. Xu and L.B. Zhang	159
Modelling and Simulation of Spherical Inverted Pendulum Based on LQR Control with SimMechanics M. Fajar, S.S. Douglas and J.B. Gomm	163
The Finite Element Analysis and Optimization of Wave-Framebased on ANSYS S.J. Wang and L.B. Yang	168
Establishment of Tooth Profile Curve Mathematical Model of Varying-Coefficient-Shift-Modification Gears C.Y. Zhang and J.G. Han	172
Computer Aided Design and Three-Dimensional Modeling of High-Order Deformed Elliptical Gear Z.D. Huang, A.M. Hui, P. Chen and Y. Wang	178

Chapter 4: Heat Engineering and Emission Control in Automotive Industry

Evaluation of the Effectiveness of Heating Systems Applied in City Buses M. Bajerlein, J. Merkisz and P. Daszkiewicz	185
Eight Surfaces of Radiation Heat Transfer Network Model Development U.K. Ibrahim, R.M. Salleh and W. Zhou	191

The Comparison of the Exhaust Emissions from an Agricultural Tractor and a Truck P. Lijewski, J. Merkisz, P. Fuc and P. Daszkiewicz	196
Controlling CO₂ and CH₄ Emission in a Degraded Peat Swamp Forest Related to Water Table and Peat Characteristics L. Kalsum, n. Ngudiantoro, M. Faizal and A.H. Pks	202
The Impact of Electric Hybrid Compressor to Make Transport Environmentally Friendly M. Bajerlein	207
The Flow and Heat Transfer Characteristic of Curved Channel CPU Water-Cooled Heat Sinks Y.F. Liu, X.H. Li and S.P. Li	213

Chapter 5: Electrical Engineering and Electric Machines

Enhanced Delay Feedback Control of Chaos Motion in Permanent-Magnet Synchronous Motor H.J. Wang, T.T. Yun, H. Zhao and Y.J. Yue	219
Research on Rotor Field Oriented Control of Dual-Three Phase Induction Machine L.H. Li, F. Long, J.J. Yin and B.Q. Wang	223
Analysis and Optimization of Electro-Hydraulic Proportional Speed Synchronous System Based on AMESim N. Xie, P.W. Chen, J.J. Guo, X. Chen and B. Wen	228
New Type of Two Degree of Freedom Motor Three-Dimensional Tooth Layer Field Application and Solution W.H. Yang, H.X. Chen, S. Xie and C.R. Fang	232
Analysis and Design of Series Transformer W. Yu, L. Li and Z.B. Zhao	237
A New Multifunctional Bioreactor Based on Linear Motor D.S. Wang, Y.T. Men, L.L. Gao, X. Dong, J. Lu and C.Q. Zhang	242
Estimation of Electric Vehicle Battery Ohmic Resistance Using Dual Extend Kalman Filter Q.Y. Chen and K.X. Wei	246
A New Loading Device Driven by Voice Coil Motor P. Xu, Y.T. Men, B.S. Xu, Q. Yang, J. Lu and C.Q. Zhang	250

Chapter 6: Power System and Energy Engineering

The Optimal Design and Analysis of Stand-Alone Hybrid Generation System of Wind and Solar Energy Y. Shen, W.P. Chai, J.R. Kang, Y.K. Zhang, M.Y. Wang and T. Mou	257
The Study of Energy Storage Technology Application in Wind Power Integration X.N. Xu and X.S. Zhou	261
Research on Supporting Effect of Dynamic Var Compensation to the Security of Large-Scale Wind Power Integration X. Li, P. Li, N.B. Wang, D.Z. Chen, X.R. Zhu, Y.T. Song and M.S. Ding	265
Preliminary Study on the Influence of Wind Power on Low-Frequency Oscillation under Outward Transmitting Thermal Generated Power Bundled with Wind Power Typical Scene P. Li, N.B. Wang, D.Z. Chen, X.R. Zhu and Y.T. Song	271
Sino-Singapore Tianjin Eco-City Wind and Solar Hybrid Lamps Testing System Design and Application D.S. Zhang and B.X. Sun	277
Study on Voltage Stability Weak Buses of Power System with Multiple Power Sources Integrated J.L. Li and W. Wei	281
PV Panels Laying Method Study Y.D. Ye	287
The Research of Power System Stability Problems Caused by Integration of Large-Scale Wind Power X.N. Xu and X.S. Zhou	291

Power Flow Calculation Based on Power Losses Sensitivity for Distribution System with Distributed Generation	
N. Li, Y.G. Li and Q.J. Zhou	295
Application of Damper in the Seismic Engineering	
T.F. Zhong, Y. Bai and Y.J. Sun	301

Chapter 7: Electronics and Integrated Circuits, Embedded Technology and Applications

The Design of Pulse Detection System	
L. Li and K. Li	307
Grid-Connection Control of PV Power Generation in Micro-Grid	
H. Zhao, H. Wang, H.J. Wang and Y.J. Yue	311
Design of Elevator Logic Control System	
D.M. Zhang and H.J. Liu	315
Analysis of Typical Time Synchronization Technology in Wireless Sensor Network	
Y.Y. Zhang, Z.L. Liu and R. Ma	318
The Effect and Analysis of Cable Distributed Capacitance on Secondary Side Harmonics in Port Power Distribution System	
W.H. Yang, H.X. Chen and R.G. Li	323
Based on MCF52234 CAN/Ethernet Gateway Design and Research	
Y.X. Guo, G.H. Li, S. Li and M. Li	328
An Electrochemical Sensor for DNA Detection Based Metal Nanoparticle Modified with Cyclodextrins	
H. Fan, L. Cheng and H.F. Cui	332
Reliability and Sensitivity Evaluation of the Station Bus Systems Configuration	
Y.G. Liu, S.Z. Liao, J.H. Liang, T. Zeng and Z. Liu	336
Research on FBG Vibration Sensing Technology	
Z. Yang, W. Liu and T. An	340

Chapter 8: Manufacturing and Industrial Engineering, Management Applications

The Design of Temperature-Controlled of Wood Drying Remote Monitoring System Based on Fuzzy PID	
Y.L. Jun, S.Y. Liu, H. Wang and S. Qin	347
Simulation and Optimization of NGE-MR Natural Gas Liquefaction Process	
L. Zhang, L.X. Che, S.S. Bi, H.S. Wang, J.T. Wu, J. Qiao and X.Y. Meng	352
Research on Maintenance Cycle Optimization of Power Generation Equipments Based on PSO	
Y.G. Liu, Z. Liu, J.H. Liang, S.Z. Liao and K.P. Yang	358
Research on the Cost Management of Construction Machinery Based on Lean Thought	
Q.Q. Zheng and Y.N. Zhang	362
Knowledge Management for Manufacturing Process Based on Knowledge Lifecycle to Enhance Data Sharing (Perception: Application and Benefits)	
Y. Kurniawan	366
Modeling and Analysis of Plunge Milling Force Based on Orthogonal Experiment	
X.H. Niu, X.L. Meng, Z.T. Zhang, R. Zhao and B.F. Shen	372
Core Variation in the Entrance Region Flow of Casson Fluid in an Annuli	
A. Kandasamy and R.G. Pai	376
Research of Modular Design for Stamping Dies	
S.L. Lu, D.S. Bi and G. Yang	382
The Application of CFD in Wood Drying Kiln System Identification	
L.J. Yu, J.G. Sun, J. Chen and H. Wang	386
GA Implementation Path Optimization of Pneumatic Marking System	
L. Shao, H.B. Zuo and N. Liu	390

Automatically Extraction of Lineaments from DEM C.X. Liu, L. Tan, C.Z. Ni and Y.F. Yan	394
Experimental Method to Evaluate Unbalance Vibration for Machine Tool Spindle Integrated with Automatic Balancer H.W. Fan, M.Q. Jing and H. Liu	398
Experiment Study on Force of Hoisting Triangular Gate of Ship Lock in Tidal Reach T. Wu, J. Ding and L.L. Wu	402
Fabrication and Design of Customized Maxillofacial Biomodel for Implant Using Computer Aided Design and Rapid Prototyping Technique W.Y. Way, M. Aichouni, M.Z.A. Zulkiflee and M.S. Ahmad Derifae	406
Test of Multiple Breaks in Long Memory Process: An Unknown Mean Breaks Case L. Deng	410

Chapter 9: Modern Control and Automation

Sliding Mode Control of Servo System with Brushless DC Motor Based on Nominal Model F. Wang, Y.X. Su, H. Min and F. Long	415
Simulation on Active Disturbance Rejection Control W. Zhang, Y.B. Cai and X.T. Wei	420
On Controllability and Output-Controllability of a Class of Remote Learning Discrete Control Systems with Data Dropout Compensation M. De la Sen, S. Alonso-Quesada and A. Ibeas	424
The Research on Temperature Control System of Heat Transfer Station Based on Genetic Algorithm PID Control L. Shao, N. Liu and H.B. Zuo	433
Design and Application of Car Type Annealing Furnace Temperature Control System Y. Wang and W.H. Lin	437
Contour Extraction Based on Improved Snake Model and its Application in Vehicle Identification S.M. Liu, Y.P. Huang and R.J. Zhang	441
The Control System Method Design for the Three-Phase Inverter Parallel Using CANOpen Protocol D. Guo and J.F. Li	448
The Ignition Advance Angle Control of CNG Automobile Based on BP Neural Network D.H. Chen and W.F. Chao	453
Distributed Control in Waterflow-Like Locomotion for UBot Modular Robot over Uneven Terrain Y.H. Zhu, D.Y. Bie, X.L. Wang, J.C. Yin and J. Zhao	457
Intelligent Control for Mobile Robot Path Tracking Based on Advanced PSO D.F. Cheng, H.S. Han, H.F. Liu and J.W. Ji	461

Chapter 10: Monitoring, Detection, Measurement Technologies

Measuring Mass Transfer on Biodiesel Process by Means of Impedance Measurement T. Rachmanto, D. Allanson, C. Matthews and I. Jenkinson	467
Electromagnetic Measurement System for Monitoring Crack of Conductivity Material D.Y. Wu	473
Frequency Domain Analysis of Fluidized Beds with Vibration Time Series of the Bed Wall H.R. Norouzi, H. Azizpour, R. Zarghami, J. Chaouki and N. Mostoufi	477
Video-Based Integrated Fire Detection, Positioning and Water Cannon Suppression Intelligent System W. Yuan, J. Yuan, Y.D. Li, X.W. Wang and Y.M. Zhang	482
Adaptive Corner Detection Based on Direct Curvature Scale Space B. Liao, H.Y. Sun and J.G. Xu	488
The Computer Control System of Heat Exchange Station Based on Wireless Remote Monitoring of GPRS-Internet L. Shao, N. Liu and H.B. Zuo	493

Application of Laser Doppler Technique in Measurement of Explosive Container Based on Frequency Correction	
H.L. Liu, L. Shao, H.B. Zuo and N. Liu	497
Low-Power WSN Measurement Node for Greenhouse	
D.H. Chen and W.F. Chao	501

Chapter 11: Communication Systems and Engineering

Realization of Multi-Frequency Multi-Polarization technique in Radar	
C.Q. Mo, Q.J. Chen and H.Y. Dai	507
Study on Band-Gap Characteristics of EBG Material and its Application in Microstrip Antenna	
Z.Q. Wang, L.D. Peng, B. Li and R.S. Xu	512
Communication with Computer via Virtual Port	
G. Du	516
Research of the Distance of Transmitting Antenna and Test Window to Measure Shielding Effectiveness of Material Using Shielded Room Method	
L.J. Qin and H.L. Yang	520
Reconfigurable Switch Software Platform Technology and its Application in Electric Power Communications Access Device	
H. Huang, H. Yu, Q. Yu and Z.H. Zhang	524
Design of Dual PON-MAC ONU Dedicated for Communication System of Power Distribution and Utilization	
Q. Yu, P.F. Yu, H. Huang, W. Chen, J. Ren and Z. Huang	528
The Research and Design of the Dual-Band Microstrip Patch Antenna	
X.Y. Cao and H.Z. Yang	532
Improved Algorithm Based on the DFT Transform Channel Estimation and Threshold Filtering	
C. Ma, C.X. Xiao and J. Zhu	536
Design for Network Management System Assessment in Power Communication Network	
F.J. Sun, M. Zhang, J.L. Qi, H.L. Li, W.Q. Wang and H. Wang	540
Sensitivity Analysis of a Bayesian Network Model on PCM Equipments	
H.S. Gao and X.R. Wang	544

Chapter 12: Signal Processing and Data Mining

An Adaptive and Blind Watermarking Algorithm Based on Shearlet Transform	
J. Xu	551
Design of Radar Echo Signal Processing System Based on FPGA and DSP	
Y. Chen, Q.Q. Xu and J.W. Leng	555
The Research and Application of the Heat Meter with Infrared Data Communication Technology	
Y.S. Li and J.Q. Wang	560
Image Analysis Based on the Haar Wavelet Transform	
C.H. Ma, Y. Li and Y. Wang	564
A New High Resolution Measurement Technology of D Flip-Flop Output Signals for Measuring Frequency Difference	
J.F. Dong, W.Y. Zhang, H.L. Liu and Y. Wei	568
Design of Driving Cycle Data Acquisition System Based on GPS	
L. Jing, R.J. Wan and K.X. Wei	572
Study of Improved Feature Technology for Abnormal Sound Recognition Based on Empirical Mode Decomposition	
H. Wang, L. Wang, Y.L. Jun and S.Y. Liu	576
A Real-Time Multiple Acoustic Sources Localization Method Using Widely Spaced Microphone Array	
T.Y. Gu, Z. Zhao, Y.Q. Wu, Z.Y. Xu and J.Y. Wang	580

Design of the Remote Control Car System Based on Brain-Computer Interface J.Y. Li and H.J. Wang	584
Heat Meter Calibration Device of Flow Control Based on Self-Learning Double-Controller Y.S. Li and D.C. Feng	588
Enhancement of Ev On-Board Diagnostics System into Preliminary Operation Using Estimation Theory C.L. Chen and C.W. Hsu	592
Analysis about Random Failure Indicator for Relay Protection Z.F. Peng, M.Y. Yang, Q.J. Zhou and C.Y. Yuan	596

Chapter 13: Information Technologies and Networks

Design of the Upper Computer System in the Overhead Crane Wireless Data Management System J.F. Li, P. Zhang, Q. Gao and S.S. Chen	603
Voltage Sag Source Localization Based on the Voltage Distance Function in Distribution Network Y. Liu, J.H. Wang and C.Y. Yang	607
Survivability Assessment Modeling for Command Information System X.H. He, Y.N. Ma and Q.S. Guo	611
Optimal Configuration of Fault Indicator in Distribution Network L.J. Qin and X.B. Chen	615
Substation Locating and Sizing in Distribution Network Based on Geographic Information Z. Wang, S.Q. Sheng and Q.J. Zhou	619
The Research on Automatic Generation of Process Diagram in CAPP System for Shaft Parts J.H. Yu, M.H. Wu and S.C. Ren	624
A System Dynamics Approach for Evaluating Policies on Prioritizing Public Transportation K.D. Li, S.E. Zhou and X.M. Yang	628