
Contents

Chapter 1 Simulation and Virtual Reality Enabled Design and Manufacture Analysis..... 1

Simulation-Enabled Approach for Defect Prediction and Avoidance in Forming Product Development..... 3
M.W. Fu and J. Lu

A Case Study to Support Conceptual Design Decision Making Using Context Knowledge 13
Fayyaz Rehman, Xiu-Tian Yan

Dynamic and Visual Assembly Instruction for Configurable Products Using Augmented Reality Techniques 23
Tapio Salonen, Juha Sääski

Finite Element Analysis of Square Cup Deep Drawing of Pure Titanium Metal Sheet at Elevated Temperatures..... 33
Tung-Sheng Yang

Simulation on Profile Control of a Plate Finishing Rolling Mill 43
Yan Peng, Dongcheng Wang

Magnetic Field and Forces Analysis of Precision Linear Motor with Air-bearings..... 53
Xuedong Chen, Jin Lei

Analysis and Optimization of Modal Characteristics of the Base of the Cartesian Robot 63
Lixin Lu, Guiqin Li, Huan You, Limin Li

Numerical Analysis on the Temperature and Thermal Stress Distribution in Adhesive Joints 71
Ning Zhao, Leilei Cao, Hui Guo, Qingjian Jia and Jianjing Dai

Kinematical Modeling for Main Machines and Integrating into Beverage Packaging Production Line 81
Yong-Chao Wang

Gasketed Joint's Relaxation Behaviour During Assembly Using Different Gaskets: A Comparative Study	91
<i>Muhammad Abid and Saad Hussain</i>	
Finite Element Simulation in Flat Rolling of Multi-Wire	101
<i>Wei-Shin Lin, Tung-Sheng Yang, He-Jiun Hsieh and Chun-Ming Lin</i>	
Heat Transfer Characteristics inside an Evaporator of a Two-Phase Closed Loop Thermosyphon with Saw Tooth Ribbed Evaporator Surface	111
<i>S. L. Mahmood, N. Bagha, M.A.R. Akhanda, A.K.M.S. Islam</i>	
3rd Order Double B-Splint Surfaces and the 3rd Order Contact in NC Machining	121
<i>Guran Liu, Quanhong Liu, Dongfu Zhao, Deyu Song, Jingting Yuan</i>	
The Research of Product and Project-based Aerospace Product Lifecycle Management.....	131
<i>Haicheng Yang, Qing Su, Shikai Jing, Sanchuan Cheng, Miao He</i>	
Application of Soft Computing Techniques to a LQG Controller Design....	137
<i>S.G. Khan, W. Naeem, R. Sutton and S. Sharma</i>	
GA-based Automatic Test Data Generation for UML State Diagrams with Parallel Paths.....	147
<i>C. Doungsa-ard, K. Dahal, A. Hossain, T. Suwannasart</i>	
 Chapter 2 Materials Design and Processing	 157
Rational Synthesis of Calcium Phosphates with Variable Ca/P Ratios Based on Thermodynamic Calculations	159
<i>Qingfeng Zeng, Jiayin Song, Litong Zhang, Xiu-Tian Yan, Yongdong Xu, Laifei Cheng</i>	
Study on Residual Stresses in Milling Aluminium Alloy 7050-T7451.....	169
<i>Z. T. Tang, Z. Q. Liu, Y. Wan, X. Ai</i>	
High-speed Friction and Wear Behaviour of Ultra-fine Grain Cemented Carbide Cutting Tool	179
<i>Y.Z. Pan, X. Ai, J. Zhao, Y. Wan</i>	
Study on Adiabatic Shear Behaviour in Orthogonal Cutting of H13 Steel ..	189
<i>Shihong Lu, Qingyang Xie</i>	
Study on Effect of Material Strain Rate in Contact Layer on Surface Integrity in Quick-point Grinding	199
<i>S.C. Xiu, C.H. Li, G.Q. Cai</i>	
Chemical Vapour Deposition Phase Diagrams for Zirconium Carbide	209
<i>Jinling Liu, Yongdong Xu, Laifei Cheng, Litong Zhang, Yiguang Wang</i>	

Research on Toughening Mechanics of Zirconia Toughened Alumina Composite Ceramics.....	215
<i>B. Zhao, B.Y. Du and T.L. Duan</i>	
Investigation on the Built-up Edge of Aluminium Matrix Composites	223
<i>Dazhen Wang, Peifeng Feng, Huaming Liu</i>	
Modelling of Temperature History During Machining of Cast Aluminium Alloy	231
<i>Wen Jun Deng, Wei Xia, Xiao Lin Zhao, Yong Tang</i>	
Effect of Sandwich Structure on Mechanical Properties of Gray Cast Iron Plates	241
<i>Xin Zhao, Tian-Fu Jing</i>	
 Chapter 3 Manufacturing System Design and Analysis ...	 249
General Stiffness Analysis for Multi-Axis Machine Tool.....	251
<i>Rong Yan, Fangyu Peng, Bin Li</i>	
A RFID-based Intelligent Control Framework for Plant Production	263
<i>Guanghui Zhou, Pingyu Jiang, Mei Zheng</i>	
Application of Lubrication Theory to Optimise Grinding Fluid Supply-Surface Integrity Evaluation	273
<i>Changhe Li, ShiChao Xiu, Guangqi Cai</i>	
The Development and Application of Reconfigurable Production Line for Automobile Electromotor	283
<i>Guiqin Li, Jie Li, Fanhui Kong, Qingfeng Yuan, Minglun Fang</i>	
Analysis on Volumetric Positioning Error Development due to Thermal Effect Based on the Diagonal Measurement	293
<i>J.H. Shen, J.G. Yang, C. Wang</i>	
Testing Research on the Thermal Error Characteristic of Ballscrew Feed System.....	303
<i>Junyong Xia, Youmin Hu, Yaqiong Lv, Bo Wu</i>	
Simulation Based Process Parameters Study of the Tube Roll-cutting	315
<i>Feng Liu, Enlin Yu</i>	
Online Control Model of Rolling Force Considering Shear Strain Effects ..	325
<i>Gui-guo Wang, Feng-shan Du, Xue-tong Li, Xin-liang Zang</i>	
Digital Simulation and Performance Analysis on the Roller of a Roller Mill.....	335
<i>X.B. Ze, D.J. Kong, B. Yang, F. Zhao and X.F. Yang</i>	

A Type of Elimination-Random Direction Algorithm of Optimum Design	345
<i>Zhixin Han, Minfeng Zhou, Yangzhou Song</i>	
Study on Simulative Design in Mixer Rotor Based on Rheological Theory	355
<i>Kejuan Chen, Hongyu Yang, Zheng Lu</i>	
Stochastic Subspace Model Identification and One-step Prediction on Time Series Data	367
<i>Na Meng, Yi-qi Zhou</i>	
Hybrid Discrete Optimization Using Lingo Software for the Design of Mechanical Transmission Systems	377
<i>Youxin Luo, Xianfeng Fan, Dazhi Li, Huixin Guo</i>	
Toward the Manufacturing Software Interoperability	387
<i>Jianxun Zhao, Zhenming Zhang, Xitian Tian, Xiaoliang Jia</i>	
Overview of Modelling, Scheduling, Planning, and Control Using Petri Net Representation and AI Search	397
<i>Shuang Cang and Hongnian Yu</i>	
An Overview of Simulation in Supply Chains	407
<i>Xin Zheng, Hongnian Yu and Anthony Atkins</i>	
The Development of a Stamping Blank Optimal Layout System Based on Interval Method.....	417
<i>Bo Wang, Chi Zhou, Yu-ping Huang, Feng Ruan</i>	
Design of the Wireless Temperature Measurement Alarming System in the High-Voltage Transformer Substation	429
<i>Qiang Gao, Hongli Wang, Huaxiang Wang</i>	
 Chapter 4 Machine Tools and Manufacturing Technologies	
439	
The Tool Life Analysis of Ceramic Turning Tools Under the Cumulative Action of Different Cutting Speeds	441
<i>Wei-Shin Lin</i>	
Optimisation of Machining Parameters for NC Milling Ultrahigh Strength Steel.....	451
<i>X.B. Gao, H. Tao, P.P. Zhang, H.J. Qiu</i>	
A New Method for Piston Ring Contour Cutting Based on Linear Driving	463
<i>Yicheng Zhang, Zhihua Chen, Liangcai Yang, Jihong Chen, Xiaoqi Tang</i>	
Product Lifecycle-oriented BOM Similarity Metric Method	473
<i>Junhao Geng, Zhenming Zhang, Xitian Tian, Dinghua Zhang</i>	

Studies on FE Modelling and Stress Characteristics of Joining in the Steel-aluminium Hybrid Structure of Car Body	483
<i>Jiangqi Long, Fengchong Lan, Jiqing Chen</i>	
Integrated Highly Effective Deep Hole Processing Technology	493
<i>Fu Jia Wu, Feng Chen</i>	
Game Theory Strategy for Information Standardization Work in Manufacturing Enterprise.....	503
<i>Jianjun Jiang, Junbiao Wang, Shuguang Li, Jianxin Zhang</i>	
Stability and its Influence Factors for High-speed Milling	513
<i>W.X. Tang, Q.H. Song, S.S. Sun, B.B. Li, B. Du, X. Ai</i>	
Concurrent Intelligent Manufacturing Based on RFID.....	521
<i>Zhekun Li, Fuyu Li, Lei Gao, Yujing Fan</i>	
Realization of CNC System on Middle-Convex and Varying Oval Piston Machining	531
<i>Hongen Wu, Guili Li, Daguang Shi and Chengrui Zhang</i>	
Research and Development of Lingsteel Temper Rolling Mill and Key Technique Study.....	541
<i>Qinglong Ma, Dongcheng Wang, Hongmin Liu</i>	
Locating Correctness Analysis and Modification for Fixture Design	551
<i>G.H. Qin, W.H. Zhang, M. Wan, S.P. Sun, T.J. Wu</i>	
Research of Surface Quality and Wear Tribological Properties of Ceramic Wire Drawing Die Based TiC Machined by Superfine B4C Grinding Agent.....	563
<i>Xuefeng Yang, Hongyan Wang, Jianxin Deng, Xiangbo Ze, Hui Wang</i>	
Research on 2-D Adaptive Rough Surface for Asperity Contact Problem...	571
<i>Quanren Zeng, Geng Liu, Tianxiang Liu, Ruiting Tong</i>	
Application of Modified Geometry of Face-Gear Drive with Double Crowned Helical Pinion.....	579
<i>YunBo Shen, ZongDe Fang, Ning Zhao, Hui Guo, XiaoChun Zeng</i>	
Study on the Uncertainties of Form Errors Evaluation Under the New GPS Framework	589
<i>Changcai Cui, Xiangqian Jiang, Fugui Huang, Xiaojun Liu</i>	
Development of a Web-Based Expert System for Metal Cutting Burr Prediction.....	601
<i>Yunming Zhu, Guicheng Wang, Shutian Fan, Haijun Qu, Chunyan Zhang</i>	

Chapter 5	Manufacturing Planning.....	611
Process Routing Planning System Based on PDM.....		613
<i>Xiao-long Liu, Xitian Tian, Zhenming Zhang, Dinghua Zhang</i>		
Service-driven Manufacturing Information Processing for Digital Manufacturing Workshop.....		623
<i>Bing Chen, Shan Li, Dinghua Zhang, Pingyu Jiang</i>		
Multi-agent Quality Tracking and Control for Inter-enterprise Based on a Fractal.....		633
<i>Damin Xu, Liping Zhao, Yiyong Yao, Yongtao Qin</i>		
Exploring Parameterised Process Planning for Mass Customisation.....		643
<i>Xitian Tian, Lijiang Huang, Xiaoliang Jia, Zhenming Zhang</i>		
A Task Compatibility Index for Multi-fingered Robot Hand Grasp Planning.....		653
<i>Qingyun Liu</i>		
Process Control of Enterprise Innovation and Adaptability Control Based on Rapid Prototyping.....		663
<i>Renping Xu, Kunqian Wang, Min Li</i>		
Process Parameters Effect on a Rectangular Tube Hydro-Forming with Magnesium Alloy		671
<i>S.Y. Lin, C.M. Chang, S.S. Chi</i>		
Quality Prediction of Centrifugal Barrel Finishing Using Genetic Neural Network		687
<i>Chun-Hua Song, Jin-Xi Cao, Shi-Chun Yang</i>		
Model Driven Engineering of Economy of Scope Systems.....		697
<i>Z. Cui, R.H. Weston</i>		
Customer Requirement Translation and Product Configuration Based on Modular Product Family		707
<i>Guangxing Wei, Yanhong Qin</i>		
Embedded Data Acquisition Platform Research Oriented to Inter-enterprise Quality Control		719
<i>Yiyong Yao, Gang Dai, Liping Zhao</i>		
Chapter 6	MEMS.....	729
Geometrical Integrity of Microholes Drilled by Conventional and Micro Electrical Discharge Machining		731
<i>M.Y. Ali, M.R. Rosfazila, E. Rosnita</i>		

The Reliability Analysis of the Precision Micro-Punch Life with IC Packing Bag.....	741
<i>Wei-Shin Lin, Jui-Chang Lin, Kingsun Lee, Jiing-Herng Lee, Ben-Yin Lee</i>	
Development of Micro-Assembly Machine Using Linear Motors.....	749
<i>D.L. Zhang, C.T. Kong, X.Y. Tang, F. Yang</i>	
Efficient Laser Drilling with Double-Pulse Laser Processing.....	759
<i>X.D. Wang, X. Yuan, S.L. Wang, J.S. Liu, A. Michalowski and F. Dausinger</i>	
Prototyping of the Computer Integrated Manufacturing Processes of MEMS in a Desktop Micro-factory	767
<i>Yubo Wang, Weizheng Yuan, Chengyu Jiang</i>	
Experimental Research on Electrochemical Micro-machining	775
<i>M.H. Wang, D. Zhu, W. Peng</i>	
FEM Calculation of Microscale Laser Shock Processing on MEMS Material with Excimer Laser	785
<i>Zhigang Che, Liangcai Xiong, Tielin Shi, Likun Yang</i>	
Study on Temperature Control in the Laser 3D Deposition Process and the Temperature Influences to the Shaping Quality	793
<i>M.D. Wang, D.W. Zuo, M. Wang, P.F. Zhu, S.H. Shi</i>	
 Chapter 7 Special Manufacturing Techniques and Industrial Applications.....	 801
Research on the Electrode Resistance in EDM Based on Orthogonal Experiment	803
<i>Yang Yang, Lei Yin, Renping Hu, Zhuohua Yu</i>	
A Pratical In-Situ CO₂ Laser Drilling System for Plasters.....	815
<i>Xuemin Zhao, Xiaodong Wang, Shenglie Wang, Xiao Yuan</i>	
Continuous Finish Processes Using Combination of Grinding and Electrochemical Finishing on Screw Surfaces	823
<i>P.S. Pa</i>	
Pre-drawing and Air-bulging Technology Used in the In-Mould-Decoration Thermoforming Process for Complex Plastic Products	835
<i>S.M. Chen, F. Ruan, Z.J. Zhang, W.H. Gan</i>	
A Research on a System Development Process Model for Industrial Solutions	845
<i>Wei Wei, Ming Yu, Walter Filipp Rosinski, Adrian Koehlein, Lei Li, Zhaoxian Huang</i>	

**Performance of a Flange Joint Using Different Gaskets
Under Combined Internal Pressure and Thermal Loading 855**
Muhammad Abid, K.A. Khan, J.A. Chattha

**Experimental Research and FEM Analysis
of the Two-Axle Rotary Shaping with Elastic Medium..... 865**
Shihong Lu, Xia Jin, Juan Bu

Application of Artificial Muscles as Actuators in Engineering Design..... 875
Zhun Fan, Kristoffer Raun, Lars Hein, Hans-Erik Kiil

Author Index..... 885

Advanced Design and Manufacture to Gain a
Competitive Edge
New Manufacturing Techniques and their Role in
Improving Enterprise Performance
Yan, X.-T.; Jiang, C.; Eynard, B. (Eds.)
2008, XX, 891 p., Hardcover
ISBN: 978-1-84800-240-1