## Mechanical and Aerospace Engineering V

Selected, peer reviewed papers from the 2014 5th International Conference on Mechanical and Aerospace Engineering (ICMAE 2014), July 18-19, 2014, Madrid, Spain

von Dashnor Hoxha, Francisco E. Rivera, Ian McAndrew

1. Auflage

Trans Tech Publications 2014

Verlag C.H. Beck im Internet: www.beck.de ISBN 978 3 03835 223 5

## **Table of Contents**

**Preface, Committees and Sponsors** 

## **Chapter 1. Applied Mechanics and Manufacturing**

On-Machine Measurement System Implemented Based on Fanuc CNC System Using a Touch Trigger Probe R. Zhang and Y.P. Wang	3
Evaluation of the Fatigue Linear Damage Accumulation Rule for Aeronautical CFRP Using	_
Artificial Neural Networks P. Zuluaga-Ramírez, M. Frövel, Á. Arconada, T. Belenguer and F. Salazar	8
Study on Water Cushion Belt Conveyor X.W. Liu, J.S. Wang, L.T. Wu, X. Zhang and H. Cheng	14
A Game Theoretic Analysis on Cloud Manufacturing Model Q.Y. Chen, Z.H. Wu, L.C. Luo and J.G. Tong	19
Study the Effect of CaCO <sub>3</sub> Nanoparticles on the Mechanical Properties of Virgin and Waste Polypropylene	22
A.S. Najim, N.J. Hadi and D.J. Mohamed  Contact Pressure Distribution in Joints Formed by V-Band Clamps	23
S.M. Barrans, G. Khodabakhshi and Q. Xu	34
<b>Determining a Robust, Pareto Optimal Geometry for a Welded Joint</b> S.M. Barrans and H.E. Radhi	39
Application of Peridynamic Theory to Nanocomposite Materials M. Duzzi, M. Zaccariotto and U. Galvanetto	44
<b>Application of Shainin Design of Experiment Method on Metal Turning Operation</b> C. Saikaew, C. Chanapal and T. Phrachai	49
Study of a W-Beam Guardrail Behaviour in Road Safety Barriers N. Peixinho, J. Tavares and J. Meireles	54
Analysis of the Torsional Load Capacity of V-Section Band Clamps S.M. Barrans, A. Waterworth and S. Sahboun	59
Characterization and Modeling of Ladle Teeming Process B.A.B. Ribeiro, L.S. Oliveira and R.P. Tavares	65
Modeling and Analysis of Kinetic Characteristics of a Gear-Linkage Mechanism X. Zhang, C.Y. Pan, H. Chen, W.Y. Zhang and W.B. Zhang	70
Study on Spring-Back Effect with Various Temperature of Magnesium Alloy in Roll Forming Process	
D.H. Kim, D.H. Yoon, H. Yu and D.W. Jung	75
Influence of MoN Sputtering Coating on Wear Resistance of a Fishing Net-Weaving Machine Component P. Srisattayakul, C. Saikaew, A. Wisitsoraat and N. Intanon	80
On Approximation of Reserve Factors Dependency on Loads for Composite Stiffened	
Panels G. Sterling, P. Prikhodko, E. Burnaev, M. Belyaev and S. Grihon	85
Improving the Mechanical Properties of a Machine Component of a Fishing-Net Weaving Machine by Duplex Coating  N. Intonon, C. Spilogov, A. Wigitzgreet and R. Spigettevelcul	90
N. Intanon, C. Saikaew, A. Wisitsoraat and P. Srisattayakul  Mechanical Performance Analysis of Composite Scarf Joints with Debond Flaw	90
X. Guo, Z.S. Li, W.C. Zhang, R.M. Tan and Z.D. Guan	95
Compressive and Shearing Mechanical Anisotropy of Aluminum after ECAP C.G. de Faria, T.A. Pedrosa, R.B. Figueiredo, M.T.P. Aguilar and P.R. Cetlin	100
Constitutive Models for Uniaxially-Post-Buckled Square Lattices E.A.F. Parra and A. Spadoni	105
Surface Morphology and Deformation Mechanism of Single Crystal Copper Treated by Laser Shock Peening	
Y.X. Liu, X. Wang, X.Q. Wu and C.G. Huang	111

Quasi-Static Compressive Properties of Aluminium Foams with Functionally Graded Properties	
N. Peixinho, P. Pinto, F. Silva and D. Soares	115
Prediction of Long-Term Compression Strength for Quasi-Isotropic CFRP Laminates J. Kang, Z.D. Guan, Z. Liu, X. Li, J.W. Mu and T.Y. Gao	119
Numerical Modeling to Determine Test Conditions of Shear Blanking Test for a Hybrid Material	
T. Sapanathan, R. Ibrahim, S. Khoddam and S.H. Zahiri	125
Mechanical Characteristic Changes of Carbon Fiber Reinforced Plastics (CFRP) Depending on the Lamination Methods I.P. Cha, H.J. Shin, M.S. Lee, S.W. Hong, J.Y. Kwon, S.H. Ko, H.G. Kim and L.K. Kwac	130
Effects of Number of Inserts and Insert Materials on Surface Roughness of Cast-Iron Work	130
Produced by Face Milling	125
S. Siwawut, C. Saikaew and A. Wisitsoraat  A Study on the Tensile Strength and Thermal Property of CFRP Using Infrared	135
Thermography Camera H.J. Shin, I.P. Cha, M.S. Lee, T.H. Kim, H.K. Yun, L.K. Kwac and H.G. Kim	140
A Comparative Study on the Hardness of CrN, CrC and CrCN Coatings	140
S. Khanchaiyaphum, C. Saikaew, P. Srisattayakul and N. Intanon	145
Comparison of Analytical Models of Force Prediction during Dynamic Bending Stage for 3-Roller Conical Bending Process M. Chudasama and H.K. Raval	150
Numerical Simulation of Compressive Response of Open-Cell Aluminum Foams	130
M. Machado and N. Peixinho	156
Taguchi Optimization of Process Parameters in Friction Stir Spot Welding of AA5754 and AA2024 Alloys	
Y. Bozkurt and M.K. Bilici	161
CNC Processing of Nurbs Curve Based on AutoCAD F. Di	167
Multi-Objective Optimization of CNC Turning Machining Parameters S.K. Pradhan and S.K. Saini	172
Effect of Powder Flow Rate and Gas Flow Rate on the Evolving Properties of Deposited	
Ti6Al4V/Cu Composites M.F. Erinosho, E.T. Akinlabi and S. Pityana	177
Chapter 2. Dynamics, Vibration and Acoustics Analysis	
A Simplified Finite Element Riveted Lap Joint Model in Structural Dynamic Analysis M.D.M. Dourado and J.F.B. de Meireles	185
A Novel Technique for Dynamic Analysis of Beam-Like Structures on Tensionless Elastic Foundations Subjected to Moving Loads	
M. Attar, A. Karrech and K. Regenauer-Lieb	192
Simulation of Sinusoidal Vibration Control Algorithm Based on Hydraulic Vibration Table X.L. Li and X. Yan	198
Research on the Water-Based Hydraulic Vibration Test-Bed Q. Liu, Y.X. Liu, C. Yang and X.L. Li	204
Vibration Analysis of Four-Edge Clamped Plain Weave Composite Plates with Different Impact Damage Patterns: An Experimental Study M. Yetmez, H. Erdogan, L. Kocer and I. Demirci	209
Numerical Model for Prediction of Cutting Forces in a Vibratory Drilling Process	209
N. Glaa, K. Mehdi and M.B. Jaber	215
Dynamics Characterization of Missiles with Control Flaps Based on CFD X. Liu, W. Liu and Y.F. Zhao	221
Rigid-Flexible Coupling Dynamics Analysis for a Twin-Rotor Piston Engine	
T.A. Zou, C.Y. Pan, X. Zhang and L. Zhang	228
The Approach to the Noise and Vibration Management in the Power Products Design G. Kmita, M. Kozupa, R. Platek, J. Krol and G. Juszkiewicz	234

The Specification of Unknown Force within Dynamic Analysis of Slider Crank Mechanism by Three Various Access	
K. Monkova, A. Cizikova and P. Monka	239
Importance of Enclosed Gas for Modal Analysis of Space Inflatable Structure F. Liu and W.L. He	244
Early Diagnosis of Spalling in the Gear Teeth M. Merzoug, K. Ait-Sghir, A. Miloudi and P.J. Dron	249
Acoustic Optimization Design Method of Gear System Z.Y. He, T.J. Lin, W. Liu and B. Liu	256
Near-Field Beamforming Source Localization for Gear Transmission in a Semi-Anechoic Room	261
A. Derouiche and N. Hamzaoui	261
Heterogeneous Speech Prediction Using LDA Classifiers M.R. Tamjis, M.N. Mansor, A.K. Junoh, A. Ahmed, W.S.W. Daud and A. Idris	267
Ultrasonic Sonic Imaging for a Two Phase System Based on Support Vector Machine Classifier  M.F.M. Dose, M.N. Monsen, A.K. Junch, A. Ahmad, W.S.W. David and A. Idria	272
M.F.M. Desa, M.N. Mansor, A.K. Junoh, A. Ahmed, W.S.W. Daud and A. Idris  Experimental Validation of the Modified Continuously Variable Command Law of a Semi- Active Suspension Integrating a Magneto-Rheological (MR) Damper	273
S. Boukerroum and N. Hamzaoui	279
Preliminary Model Analysis of Acoustic Noise Levels for Space Station Y.Q. Feng, J. Yang, G.S. Feng and Y. Wu	287
Research of Human Modeling and Motion Simulation Based on ADAMS C. Ma, Y.Q. Liu and X.Q. Zhu	292
<b>Static and Dynamic Tensile Behavior of Unidirectional Glass/Epoxy Composites</b> P. Correia and N. Peixinho	298
Chapter 3. Material Characterisation and Technology	
Influence of Power on the Microstructure and Optical Properties of Microcrystalline Si	
Influence of Power on the Microstructure and Optical Properties of Microcrystalline Si Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang	305
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal	
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of	305 309
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation	309
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in	
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo	309
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz  Evaluation of Oven and Microwave Drying of Ceramic Material with Adition of Quartzito	309 315
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz	309 315
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz  Evaluation of Oven and Microwave Drying of Ceramic Material with Adition of Quartzito to Form a Composite	309 315 320
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz  Evaluation of Oven and Microwave Drying of Ceramic Material with Adition of Quartzito to Form a Composite A.T. Charbel, C. Freitas, D. Torres, F. Moreira, L.C. Carvalho, L. Candido and V.S. Birchal  The Role of Vanadium in Reduction of Helium Diffusion in Tungsten Based Alloys B. Imran Shaban and K. Arshad  Investigation of Solid Solubility, Hardness, and Thermal Properties of Au-Ge-Sb System	309 315 320 325
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz  Evaluation of Oven and Microwave Drying of Ceramic Material with Adition of Quartzito to Form a Composite A.T. Charbel, C. Freitas, D. Torres, F. Moreira, L.C. Carvalho, L. Candido and V.S. Birchal The Role of Vanadium in Reduction of Helium Diffusion in Tungsten Based Alloys B. Imran Shaban and K. Arshad	309 315 320 325 331
Films H. Cheng, F. Jiang, C.Z. Ma and K. Jiang  Comparative Evaluation of Activated Carbons Prepared by Thermo-Chemical Activation of Lignocellulosic Residues Aiming at Phenol Removal C.C.O. Alves, A.S. Franca and L.S. Oliveira  Corrosion of Reinforcing Bars Astm A706 in Self-Compacting Concrete Subjected to Chloride Attack and Carbonation W. Aperador, J. Cortes and J. Carrillo  Tribocorrosion Behavior of [Ticn/Tinbcn]n Coating on Austenitic Steels Substrate in Hanks' Balanced Salt Solution W. Aperador, J. Duque and E. Ruiz  Evaluation of Oven and Microwave Drying of Ceramic Material with Adition of Quartzito to Form a Composite A.T. Charbel, C. Freitas, D. Torres, F. Moreira, L.C. Carvalho, L. Candido and V.S. Birchal  The Role of Vanadium in Reduction of Helium Diffusion in Tungsten Based Alloys B. Imran Shaban and K. Arshad  Investigation of Solid Solubility, Hardness, and Thermal Properties of Au-Ge-Sb System K. Thipayarat, E. Nisaratanaporn and B. Lohwongwatana  Experimental and Numerical Analysis Applied on Steel Bars Cooling	309 315 320 325 331 336

Aerodynamic Performance of Blended Wing Body Aircraft with Distributed Propulsion W.F. Yan, J.H. Wu and Y.L. Zhang	354
The Effect of Gust on Blended-Wing-Body Civil Aircraft C.F. Cai, J.H. Wu and B. Liang	359
Parametric Aircraft Design Optimisation Study Using Span and Mean Chord as Main	
<b>Design Drivers</b> P. Albuquerque, P. Gamboa and M. Silvestre	365
Wind Tunnel Study on a Missile with Forward-Facing Cavity in Supersonic Flow J. Zhang, X.J. Pan, J.G. Dong, Y.M. Qin and H.D. Ma	370
High Swept-Back Delta Wing Flow T.K.D. Hoang, P.K. Nguyen and Y. Nakamura	377
A SMA Based Morphing Leading Edge Architecture S. Ameduri	383
Vacuum Degree Measuring Technique and its Development Tendency inside a Satellite in the Thermal Vacuum Test Z.X. Xu, Y. Wu and C.L. Du	389
The Synthesis of the Robust Stabilization System of Cable Tension for the Test Bench of Weightlessness Simulation	204
T.A. Ezangina and S.A. Gayvoronskiy  Aerodynamic and Performance Analysis of Representatives of One Century of Low Speed	394
Aircraft	
L.M.F. Barbosa and P.H.I.A. de Oliveira	400
Building Data Fusion Surrogate Models for Spacecraft Aerodynamic Problems with Incomplete Factorial Design of Experiments	
M. Belyaev, E. Burnaev, E. Kapushev, S. Alestra, M. Dormieux, A. Cavailles, D. Chaillot and E. Ferreira	405
Application of Rare Event Anticipation Techniques to Aircraft Health Management S. Alestra, C. Bordry, C. Brand, E. Burnaev, P. Erofeev, A. Papanov and C. Silveira-Freixo	413
Estimation Mass of the Aircraft Wing with the Multidisciplinary Process H. Fayssal and N. Brahim	418
Improvement Design of the Insulation Structure of High Temperature Pneumatic Duct System of the Aircraft H. Shi, Y.L. Jiang, Y. Peng and Y.F. Cai	423
<b>Airborne Sensor Model Position Fidelity Determination for Combat Aircraft Simulators</b> P.S. Kumar and K.S. Kumar	429
Design and Development of Vertical Takeoff and Horizontal Transition Mini Unmanned Aerial Vehicle R. Krishnakumar, K.S. Kumar and T. Anand	436
Study on Serial MPPT Electrical Power System Stability for Space Application	430
W.L. Lin and Z.G. Liu	441
Analysis of Orbital Thermal Environment for Inclined-LEO Small Satellite J. Liu, C.L. Wang and Y.Z. Li	446
<b>State-Space Rotor Aeroelastic Modeling for Real-Time Helicopter Flight Simulation</b> R. Gori, F. Pausilli, M.D. Pavel and M. Gennaretti	451
Flight Loads Analysis of a Maneuvering Transport Aircraft H. Zhang, J. Li and Q. Liu	460
Effect of Reduced Frequency on Longitudinal Oscillatory Derivatives of an Airfoil Based on Wind Tunnel Data F.R. Marzabadi and R.K. Moghadam	465
SOA-Cloud Computing Based Fast and Scalable Simulation Architecture for Advanced Flight Management System	
D.C. Li, Q. Li, N. Cheng and J.Y. Song	471
Effect of Radiation Induced Charge Neutralization on ELDRS V.S. Pershenkov, A.S. Bakerenkov, A.T. Yastrebov, A.V. Solomatin, V.V. Belyakov and V.V. Shurenkov	478
Using Low Temperature Irradiation for ELDRS Estimation V.S. Pershenkov, A.S. Bakerenkov, A.T. Yastrebov, A.V. Solomatin, V.V. Belyakov and V.V. Shurenkov	484

Numerical Experiment of a Symmetrical Airfoil with Attack Angle of 5 Degrees in Fluctuating Relative Flow Velocity Y. Yokoi and H. Fukuta	490
Research on Numerical Simulation of Support Interference for Dynamic Derivatives at Hypersonic Flight Speeds X. Liu, W. Liu and Y.F. Zhao	495
Numerical Simulation of Powered High-Lift Flow Z.B. Gong, J. Li and B. Tian	501
Analysis of an Airdrop Motion Coupling N-S Equations with 6 DOF Motion Equations P. Hu, L.X. Wang and L.M. Guo	506
<b>Best Attack Position Model for BVR Multi-Target Air Combat</b> R. Yang, F.M. Huang and H.J. Gong	511
Analysis of an Aero-Engine Gas Path Fault Monitoring Sensor Model J.F. Qu, S.Q. Jiang, S.H. Yuan and S.F. Zeng	516
On the Physical Mechanism of the Interaction of the Microwave Radiation with the Semiconductor Diodes V.V. Shurenkov	521
Chapter 5. Fluid Dynamics and CFD Application	
Aeroacoustics Investigation of an Automotive Exhaust Muffler F.T. Borghi, J.E.M. Barros and R.M. Valle	529
Assessment of Real Gas Effects on Approximate and Boundary Layer Equations for Hypersonic Laminar Flow over Axisymmetric Bodies R.K. Moghadam and S.A. Hosseini	534
Computational Studies of Turbulent Flows in Rotating Radial and 20 <sup>0</sup> Backward Swept Diverging Channels G. Nitheesh and M. Govardhan	540
On the Unsteady Flow of Two Incompressible Immiscible Second Grade Fluids between Two Parallel Plates	
A.M. Siddiqui, M.K. Mitkova and A.R. Ansari <b>CFD Modeling and Design of Wind Boosters for Low Speed Vertical Axis Wind Turbines</b> N. Korprasertsak, N. Korprasertsak and T. Leephakpreeda	<ul><li>546</li><li>554</li></ul>
Investigation and Simulation of Supersonic Gas Jet for Martian Dust Removal Z.L. Wang, H. Xu, R.Q. Yang and W.J. Guo	559
Analysis of Variable Viscosity Channel Flow under Constant Magnetic Field via Generalized Differential Quadrature Method E. Başkaya, G. Kömürgöz and I. Özkol	564
Modeling and Simulation of Supersonic Flow in 2D Nozzle Using MacCormack's and Upwind Methods	201
M. Chegeni, M. Ehterami, M.H. Doolabi and M.S. Soltaninezhad	569
Chapter 6. Motors and Engines, Combustion and Propulsion	
The Simulation Calculation of Temperatures on Valve Seats of Combustion Engine and its Verification	577
P. Brabec and A. Dittrich  Numerical Studies of Engine Performance, Emission and Combustion Characteristics of a  Diesel Engine Fuelled with Hydrogen Blends	577
T. Ozgur, E. Tosun, C. Ozgur, G. Tuccar and K. Aydın  Study on Flame Spread over Aviation Kerosene and Diesel	582
M.H. Li, S.X. Lu, Ĵ. Guo and K.L. Tsui Investigation of Syngas Combustion at Variable Methane Composition in Can Combustor	587
Using CFD N.M. Zian, H. Hasini and N.I. Om  Investigation of Engine Posterwayers and Engineer Characteristics of Si Engine Evalled.	592
Investigation of Engine Performance and Emission Characteristics of Si Engine Fuelled with Ethanol Blends by Numerical Simulation C. Ozgur, E. Tosun, T. Ozgur, G. Tuccar and K. Aydin	597

Investigation of Effects Ofinlet Boundary Conditions on the Flow Behaviour in a Diesel Injector	
G. Tuccar, T. Ozgur, E. Tosun, C. Ozgur and K. Aydin	602
<b>Design of System Hydrogen Engine Supercharging</b> J. Popelka	607
<b>Description of Sequences of Rhythmic Motor Primitives</b> A. Gorbenko and V. Popov	612
Numerical Analysis of Tumble, Cross Tumble and Swirl Ratios in a Single Cylinder Research Engine	
L. Fonseca, R. Coelho, R. Braga, B. Pena and R.M. Valle	617
Sensitivity Analysis of the Air Flow inside a Single Cylinder Engine for Different Turbulence Models Using CFD F.G.L. Amorim, J.H.M. Ribeiro, M.G.J. Vaz and R.M. Valle	624
Modeling and Analysis on Mean Effective Torque of Rotors in Twin-Rotor Cylinder- Embedded Piston Engine	02.
H. Chen, C.Y. Pan, X.J. Xu, X. Zhang and H.J. Xu	630
Numerical Analysis of the Flow Field in the Nozzle of Hot Water Rocket Motor W.W. Sun and Z.J. Wei	635
Optimization Design for Contour of Pintle Nozzle in Solid Rocket Motor Based on Response	
Surface Method C. Cheng, F.T. Bao and H. Xu	640
Chapter 7. Control Systems, Robotics and Automatics	
Cooperative Tracking Control for Formation Keeping of Fractionated Spacecraft Based on Error Exchanging Y.F. Niu and Y.M. Gao	649
Assessment of a General Aviation Pilot Assisting System Influence on the Piloting	043
Performance and Safety of Inexperienced Pilots G.A. Santana, P.H.I.A. de Oliveira, C.A. Cimini, A.R.d.S. Filho, L.D.P.S. Ferreira and R.A. Torres	655
The Simulation of Rotor Field Oriented Control of PMSM F. Ou, H. Chen and Y. Chen	661
Real-Time Monitoring of Harmonic Currents: A Case Study of a Shopping Center P. Nakmahachalasint and S. Buain	666
<b>Design and Non-Linear Simulations of a Fault-Tolerant Flight Control</b> S.H. Almutairi and N. Aouf	671
A Hybrid Control Model to Develop the Trajectory-Tracking Controller for a Quadrotor	
UAV P.G. Diem, P.H. Anh, P.K. Nguyen, N.P. Hung and N.V. Hien	678
A Novel Approach to Model and Implement Planar Trajectory-Tracking Controllers for AUVs/ASVs N. Dong, N.H. Nam, K.M. Tuan and N.V. Hien	686
Validation of Numerical Simulation Method for Active Flow Control Technology	000
X.P. Xu and Z. Zhou	694
Symbolic Trajectory Description Using Frescoes V. Popov	700
Gait of a Biped Robot Implemented on a FPGA C. Segura and J. Cortes	705
Modelling and Comparison of Compressor Performance Parameters by Using ANFIS I. Yazar, E. Kiyak and H.S. Yavuz	710
Robotic Vision for Hospital Inspection S.H. Jamaludin, M.N. Mansor, A.K. Junoh, A. Ahmed, W.S.W. Daud and A. Idris	716
Gas Turbine Fault Detection and Isolation Using Adaptive Neurofuzzy Inference System (ANFIS)	
B. Shahriari, A.N. Shahrbabaki and A. Shahriari	721
Kinematic Analysis for Hybrid 2-(6-UPU) Manipulator Using Wavelet Neural Network A. Rahmani, A. Ghanbari and S. Pedrammehr	726

## **Chapter 8. Thermal Analysis Technologies and Applications**

Measurements of Thermal Properties of Different Building Materials A. Lakatos	733
Three-Dimensional Numerical Simulation of Mixed Convective Heat Transfer in a Horizontal Rectangular Duct Utilizing Nanofluids N.I. Om and H.A. Mohammed	738
Heat Transfer Enhancement in Turbine Blade Internal Cooling Ducts M. Karaman, I. Özkol and G. Kömürgöz	743
Comparative Study between a Heat Pump and an Electrical Resistance as Energy Support for a Solar Water Heater	7.40
R.V.M. Reis, A.A.T. Maia, L. Machado and R.N.N. Koury  Analysis of the Temperature Evolution during Lined Pipe Welding O. Obeid, G. Alfano and H. Bahai	748 753
Calculation of Heat Transfer in Heterogeneous Structures such as Honeycomb by Using Numerical Solution of Stochastic Differential Equations	
S.A. Gusev and V.N. Nikolaev  A Numerical Study of the Thermal Critical Component on FORMOSAT-7 with Phase Change Material	758
C.H. Wang, M.H. Chen, J.D. Huang and C.R. Chen	764
Application of Differential Quadrature Method (DQM) to Heat Transfer and Entropy Generation Problems	
M. Fidanoglu, G. Kömürgöz and I. Özkol	769
<b>Evaluation of Correlations for Natural Convection on the Behavior of a Wire-on-Tube Condenser</b>	
J.A. da Silva, M. dos Santos Guzella, C.B. Maia, S. de Morais Hanriot and L. Cabezas-Gómez	774
Chapter 9. Computational Techniques and Numerical Methods	
Hybrid Hidden Markov Models and Neural Networks Based on Face Recognition M.Q. Wang, D.B. Gao, Z.X. Hong and Q. Gao	781
Nonlinear Fuzzy Robust PCA Algorithm for Pain Decision Support System M.N. Mansor, A.K. Junoh, W.S.W. Daud, W.Z.A.W. Muhamad and A. Idris	785
Buckling and Post-Buckling of Composite Shells with Asymmetric Meshing in Form of Axial Band in Numerical Model	
Z.R. Tahir and P. Mandal	790
Guidance Solutions for Multiple Vehicle Assembly M. Okasha	797
Stochastic Models in Preventive Maintenance Policies O. Gölbaşı and N. Demirel	802
Infant Pain Recognition with Homomorphic Filter and k-NN Classifier M.N. Mansor, A.K. Junoh, A. Ahmed, H. Kamarudin and A. Idris	807
Study on Improving the Degree of Size Precision of Rack Tube H. Yu, D.H. Kim and D.W. Jung	814
A Numerical Study Onfire Suppression of Water Mist in Microgravity X. Han, J. Qin, J.J. Tao and M.H. Feng	819
<b>BicriteriaHeuristic for Unrelated Parallel Machine Scheduling Problem</b> Y.K. Lin and H.C. Lin	824