## **Table of Contents**

Preface, Conference Committee and the Topics and Presidents

## **Chapter 1: Engineering of Manufacturing Processes**

Improving of the Functional Parameters from Water Stations A. Alexandrescu and S.A. Miron	3
A Study on Plastic Deformations due to Contact Fatigue Wear on a Metallic Coating Deposed in Electric Arc	0
G.N. Băsescu, I.V. Crîmaru, S.I. Strugaru, A.C. Bărbînță, A. Bârcă and C. Munteanu	9
Failure Mode and Effects Analysis on Control Equipment Using Fuzzy Theory N. Belu, D.C. Anghel and N. Rachieru	16
Profiling Method of Side Mill for Threading Screw for Dental Implants S. Berbinschi, N. Baroiu, V. Teodor and N. Oancea	22
Optimum Tool Life and Cutting Speed for the Maximum Productivity at the Drilling of the Steel X6CrNiTi18-10	20
O. Blăjină, A. Vlase and V. Darie	28
Analysis of Surface Roughness for High Speed Milling of a Magnesium Alloy Part B. Chirita and N.C. Tampu	33
Aspects of Transport Optimization in Holonic Enterprise M.E. Ciortea	39
Process Smoothing of the Inner Surface of Cylinders after Honing and its Role in Eliminating Wear in the Activation of the Heat Engine	42
D. Chirita	43
Some Peculiarities of the Redundant Design Solutions A. Gonçalves-Coelho, G. Neştian, M. Cavique and A. Mourão	49
Simulation of Arc Welding Process V. Cohal	55
Technique Achievement of Glass Objects Using Kiln Casting Method C. Neagu-Cogălniceanu	61
Contributions on Design and Accomplishing of the Whirling Thread Cutting Devices that could be Adapted for Ordinary Lathes G. Cretu	67
Research Concerning the Cold-Hardening of the Teeth of a Toothed Gear at Cold Teething by Intermittent Blow I. Dobrescu and I. Banu	71
Intelligent Collaborative Platform for Testing a Product by Virtual Prototyping	/ 1
C. Dobrin and M. Cioca	77
Studies on the Hydrodynamic Flow through the Cylinder Valve D. Florescu and I. Florescu	84
The Methods to Study the Influence of the Clearance in the Case of Great Speeds and Small	
Speeds J.C. Grigore	88
Influence of Tool - Semi-Product Friction on the Force Evolution at the Simulation of the Deformation Process with Flat Wedge Tools D. Iacomi, M. Iordache, E. Niţu and S. Tabacu	93
Mechanical and Geometrical Characterization of the Conveyors Belts from Mineral	75
Resources Exploitation A.C. Ianăși and N.M. Mihuţ	99
Recovery of Precious Metals from Catalytic Converters of Automobiles by Hydrometallurgical Solid-Liquid Extraction Processes S. Ilie, A. Miutescu, M. Stoianovici and G. Mitran	105
Determination of Constitutive Equation at the Deformation of Materials Using the	103
Compression Test M. Iordache, E. Niţu and D. Iacomi	110

Estimation of Reliability Characteristics in a Production Scheduling Model with Failures and Time-Changing Parameters Described by Gamma and Exponential Distributions W.M. Kempa, I. Paprocka, K. Kalinowski and C. Grabowik	116
Installation for Determining the Nature of Excavated Material from the High-Capacity Belts of Mining Basins N.M. Mihut and A.C. Ianăși	122
Influence of Cutting Parameters on the Surface Quality of Round Parts Made from AZ61 Magnesium Alloy and Machined by Turning G. Mustea and G. Brabie	128
The Influence of Burnishing Parameters on the Surface Quality of Bars Made from AZ61 Magnesium Alloy G. Mustea and G. Brabie	135
Aspects Regarding the Hybrid Models in Engineering E. Oanta and C. Panait	141
The Study of Compression Engine Cycle Behavior in Terms of Variable Gazodynamic and Geometrical Configuration. Regime of the Maximum Economy  I. Omocea	147
Quality Oriented Self-Optimizing Control in Smart Machining Systems H.S. Park and N.H. Tran	152
Issues Concerning Vibrations Reduction of the Industrial Drilling Machine in the Manufacturing Processes M.M. Pasăre and A.C. Ianăși	158
Grapho-Analytical Determination of the Profile Disc Tool for Manufacturing of Complex Helicoidal Surfaces	130
G. Pleşu	164
The Influence of Complex Dynamic Phenomena Caused by Wind Action on Behaviour of Transportation Pipelines G. Pintilie	170
Comparative Analysis of Different Methods in Residual Stress Measurement for Polymeric Parts  A. Raicu	175
Analysis of the Linear Positioning Accuracy on Z Axis at the Horizontal Machining Centre TMA-AL-550 C. Bungău, R. Pancu and T. Buidoş	179
Thermal Runaway of the BaCO <sub>3</sub> + Fe <sub>2</sub> O <sub>3</sub> Homogenous Mixture and Mechanical Alloys at the Microwave Heating I.D. Savu, S.V. Savu and G.C. Benga	
Thermal Analysis to Evaluate Ageing Process in Heated Tool and Electrofusion Welding of	185
Polymer Pipes S.V. Savu, I.D. Savu and I. Ciupitu	190
The Influence of the Feed Rate on the Quality of Surfaces Processed by AWJ at High Pressures	
C. Schnakovszky, E. Herghelegiu, C. Radu and I. Cristea  The Metal Sheets Processed by AWJ. Analysis of the Surface Quality	196
C. Schnakovszky, E. Herghelegiu and N.C. Tampu	201
Studies Regarding Production of the Moulding Form from Calcined Gypsum G. Simionescu and M. Gheorghian	206
Researches for the Optimization of the Dehydration Process for Plums and Apricots I. Tenu, R. Rosca, P. Cârlescu and I.D. Veleşcu	212
Modular Tooling System for Ultrasonic Assisted Cutting C.G. Turc, G. Belgiu and C. Cărăuu	218
Fuzzy Logic Applications in Flanges Manufacturing C.G. Turc and G. Belgiu	223
Smart Engineering and Energy Saving Management in Edible Oil Processing Technology and Speciality Fats Industrial Application  I. Vintila	228
Improved Model to Determine the Tool Life and the Cutting Speed for Minimum Cost at Drilling the Steel 10TiMoNiCr175	
A. Vlase, O. Blăjină and V. Darie	234

## **Chapter 2: Advanced in Composite Materials and Technologies**

Protective Coatings on Carbon Steel M.L. Barhalescu	241
Comparison of Corrosion Behavior of Thin Layers from Copper, Aluminum and Chromium M.L. Barhalescu	247
Reseachers Concerning Stabilized Aluminium Foams Based on Silicon Carbide O. Bălțătescu, R.M. Florea, A. Buzăianu, C. Roman and I. Carcea	253
A Comparative Analysis of New Ti-Nb-Zr-Ta Orthopedic Alloys A.C. Bărbînță, R. Chelariu, M. Benchea, C.I. Crimu, S.I. Strugaru and C. Munteanu	259
New Composite Materials that Reduce the Effect of Reinforcement Corrosion V. Constantinescu, G.V. Bogus, R.G. Taran and I. Carcea	265
Application of New Synthesized Materials Based on Anionic Clays for Industrial Effluent Decoloration	271
L. Dartu, C. Zaharia and G. Carja  Research on Electromagnetic Properties of High Entropy Alloys  I. Florea, R.M. Florea, O. Bălţătescu, V. Soare, C. Roman and I. Carcea	271 277
In Piotea, N.W. Piotea, O. Baitatescu, V. Soare, C. Roman and T. Carcea  Investigation Techniques of <i>In Situ</i> AlMg/AlN Metal Matrix Composites via Reactive Gas Injection	21
R.M. Florea, O. Bălţătescu, A. Buzăianu and I. Carcea	283
Abrasive Wear of Fibre-Metal Composites Based on Fibreglass Woven Fabric Layer S. Zolkiewski	290
Mechanical Properties of Fibre-Metal Composites Connected by Means of Bolt Joints S. Zolkiewski	296
Chapter 3: Characterization, Modeling and Simulation of Mechanical Processes	
FEA Study on the Elastic Deformation Process of a U-Shape Bimetal Actuator M. Aignătoaie	305
A Matlab Neural Network Application for the Study of Working Conditions D.C. Anghel, A. Ene and N. Belu	310
The Stress Distribution of a Layered Contact Cam Mechanism Using Finite Element G.N. Băsescu, I.V. Crîmaru, S.I. Strugaru, C. Paulin, E.S. Bârcă and C. Munteanu	316
Simulation and Performance Analysis of a FMS/CIM Using Stochastic Timed Petri Nets D. Coman and A. Ionescu	322
<b>Design and Manufacturing Preparation of a Patient Specific Acetabular Cage</b> S. Costin and C.A. Micu	328
Real-Time Monitoring Station for Production Systems G. Ćwikła	334
3D Conductive Textile Shields C. Donciu	340
3D Conductive Textile Shields	340 346
3D Conductive Textile Shields C. Donciu Use of Finite Element Method in Optimization of Quay Crane's Grab	
3D Conductive Textile Shields C. Donciu Use of Finite Element Method in Optimization of Quay Crane's Grab C. Dragomir Geometric Analysis of Motions Exercised by the Stewart Platform	346
3D Conductive Textile Shields C. Donciu  Use of Finite Element Method in Optimization of Quay Crane's Grab C. Dragomir  Geometric Analysis of Motions Exercised by the Stewart Platform A. Dymarek, T. Dzitkowski, K. Herbuś, G. Kost and P. Ociepka  The Inverse Problem of Kinematics as the Tool for Determination of Motion Trajectories Exercised by Worm Drives of a Stewart Platform A. Dymarek and T. Dzitkowski  Synthesis of Constructive-Functional Parameters to Improving the Dynamic Behavior of Automatic Mechanisms	346 351 357
3D Conductive Textile Shields C. Donciu Use of Finite Element Method in Optimization of Quay Crane's Grab C. Dragomir Geometric Analysis of Motions Exercised by the Stewart Platform A. Dymarek, T. Dzitkowski, K. Herbuś, G. Kost and P. Ociepka The Inverse Problem of Kinematics as the Tool for Determination of Motion Trajectories Exercised by Worm Drives of a Stewart Platform A. Dymarek and T. Dzitkowski Synthesis of Constructive-Functional Parameters to Improving the Dynamic Behavior of	346 351

Analysis of Simulated Welding Thermal Cycles S700MC Using Thermal Imaging Camera J. Górka	375
About Variability of Using of Methods of the Shape Identification Based on Geometrical Correlation	
I. Gostev	381
A Survey on Capp Systems Development Methods C. Grabowik, K. Kalinowski, W.M. Kempa and I. Paprocka	387
Virtual Analysis of the Mining Support under Loads of the Roof A. Gwiazda	393
The Aid of a Mistake Proofing with the use of Mechatronic Systems According to the Poka-Yoke Methodology M.P. Hetmańczyk and P. Michalski	399
The Self-Excitation Phenomenon of Quasi Shielded Inductive Proximity Switches P. Michalski and M.P. Hetmańczyk	405
Aspects Concerning the Dynamics of the Mechanisms with Clearances J.C. Grigore	411
The Model of Discrete Production Scheduling System in UML Notation - Classes Diagrams K. Kalinowski, C. Grabowik, I. Paprocka and W.M. Kempa	416
The Graph Representation of Multivariant and Complex Processes for Production Scheduling	
K. Kalinowski, C. Grabowik, W.M. Kempa and I. Paprocka	422
Theoretical and Data-Based Mathematical Model of a Special Vehicle Breaking System M. Marinescu, R. Vilau, M. Truta, V. Vinturis and O. Fieraru	428
A Method to Obtain a Generalized Model of the Pressure Evolution within the Braking System of a Vehicle	
M. Marinescu, R. Vilau, M. Truta and O. Fieraru	434
Original Computer Based Solutions in Structural Studies E. Oanta	440
Analysis of Compression Ignition Engine Cycle Based on Irreversible Thermodynamics I. Omocea	446
A Dynamic Model of the Human Body in the Vertical Direction M. Picu	452
Assessment of a Traction Model for Agricultural Tires Based on a Variable Shear Area Model and Experimental Data R. Rosca, P. Cârlescu and I. Tenu	458
Short Term Prediction of Hydroelastic Dynamic Response in Random Waves for an 1100 TEU Container Ship I. Rubanenco and L. Domnisoru	464
Transient Regimes Analysis for a Diesel Engine A. Sabau	471
Pressure Waves Simulation in Diesel Engine Injection System A. Sabau	477
Longitudinal Loop Power Flow Analysis on a 4x4 Transmission Vehicle Taking into Consideration the Running Track Type M. Truta, M. Marinescu, R. Vilau and O. Fieraru	483
Static and Dynamic Analysis of a Planetary Gearbox Working Process M. Truta, O. Fieraru, R. Vilau, V. Vinturis and M. Marinescu	489
Non-Intrusive Hybrid Energy Monitoring System M. Temneanu and A. Ardeleanu	495
<b>Design and Realization of a Sound Module for a Miniature Model Steam-Locomotive</b> M.P. Ursu, T. Buidoş and G. Albert	500
<b>Drying Simulation of Shrinkable Clay Tiles Using Variable Diffusivity Model</b> M. Vasić and Z. Radojević	506
Complex 3D Measuring by Multiple Laser Scanning of Automotive Parts A.C. Voicu and G.I. Gheorghe	511
Mathematical Model of the Damped Variable Cross Section Beam in Transportation S. Zolkiewski and L. Dziczkowski	517

## **Chapter 4: Robotics and Computer Integrated Manufacturing**

Controlling a Social Robot - Performing Nonverbal Communication through Facial Expressions	
F. Adăscălitei, I. Doroftei, D. Lefeber and B. Vanderborght	525
Functional Evaluation and Performance Improvement of a Gantry IR's NC Axes G.C. Avram, F.A. Nicolescu, F.D. Anania and E. Strajescu	531
Simulation of the Stewart Platform Carried out Using the Siemens NX and NI LabVIEW Programs	
W. Banaś, K. Herbuś, G. Kost, A. Nierychlok, P. Ociepka and D. Reclik	537
The Command of a Virtual Industrial Robot Using a Dedicated Haptic Interface S. Butnariu and F. Gîrbacia	543
Mobile Robot Trajectory Analysis Using Computational Methods D. Coman and A. Ionescu	549
An Overview on the Design of Mobile Robots with Hybrid Locomotion A. Conduraru (Slătineanu), I. Doroftei and I. Conduraru	555
Localization Methods for Mobile Robots - A Review I. Conduraru, I. Doroftei and A. Conduraru (Slătineanu)	561
Kinematic Modelling and VR Simulation of a 3DOF Medical Parallel Robot with One Decoupled Motion	
N. Cretescu, M. Neagoe and R.G. Saulescu	567
Preliminary Ideas on Designing an Unmanned Aerial Vehicle Based on Coanda Effect O.V. Crivoi, I. Doroftei and F. Adăscălitei	573
Controlling the Movement of the Robot's Effector on the Plane Using the SVG Markup Language K. Foit	577
Integration of a Virtual 3D Model of a Robot Manipulator with its Tangible Model (Phantom)	
K. Herbus, G. Kost, D. Reclik and J. Świder	582
<b>Design of Collaborative, Cross &amp; Carry Mobile RoBots "C<sup>3</sup>Bots"</b> B. Hichri, J.C. Fauroux, L. Adouane, Y. Mezouar and I. Doroftei	588
Dynamic Modelling of a 3DOF Medical Parallel Robot with One Decoupled Motion M. Neagoe, N. Cretescu and R.G. Saulescu	594
Chapter 5: Technology Transfer	
<b>Business Ecosystems: Strategy Maps in Relation to Sustainable Development</b> E.G. Avram and S. Avasilcăi	603
Environmental Analysis Procedure for Implementation of Environmental Management System ISO 14001 in Shipping Company	60 <b>.</b>
A.L. Bostina and A. Bostina  Lititives of Toytile Industry Opposite time towards Engineers and I Issues	607
Initiatives of Textile Industry Organizations towards Environmental Issues A. Butnariu and S. Avasilcăi	612
Methods of Manufacturing Data Acquisition for Production Management - A Review G. Ćwikła	618
Model and Analysis of the Key Factors Influencing Organizational Changes Implementation within Business Processes C.P. Fuioagă (Băsu)	624
Assessment of the Risk Parameters and their use in the Vessels Traffic Management M.G. Ghiba	628
Conceptual Research Model Regarding the Effects Resulted from the Implementation of Environmental Management System at Organization Level I.V. Herghiligiu, M.L. Lupu, C. Robledo and A. Kobi	634
Technological Entrepreneurship: Success Factors as Perceived by Potential Young	034
Entrepreneurs C.M. Nacu and S. Avasilcăi	639

CFD Study on must of Grapes Separation in a Hydrocyclone P. Cârlescu, I. Tenu, M. Baetu and R. Rosca	645
Cloud Computing Environment for Engineering and Business Education G. Raicu and A. Raicu	651
Factors Influencing Employees' Motivation for Knowledge Communication G. Rusu and S. Avasilcăi	657
<b>Market Oriented Approach to the Production Management on the Operational Level</b> B. Skołud	663
The Importance of Understanding the Stakeholders in Industry Actions - A Corporate Social Responsibility Perspective I. Teodoreanu and C.I. Ivanov	669
Chapter 6: Micro and Nano Technologies	
Orthopaedic Prosthetic Systems Topographically Characterized at Nanometric Scale L.L. Badita and G.I. Gheorghe	675
ESD Garments with Bilayer Structure C. Donciu	682
Estimating ESD Properties of Fabrics Based on Correlation between Dielectric Losses and Charge Decay Time C. Donciu	688
Nanotechnology and Processes the Nanophotovoltaic Panels M.A.M. Ferreira, J.A. Filipe and J. Chavaglia	694
Modeling of Strain and Stress States for Straight Rods with Particular Cross Sections Subjected to Torsion M. Glovnea and C. Suciu	699
Dilatometry and DTA Analyses of a Sample Made of Ni Base Super Alloy with a ZrO <sub>2</sub> /20%Y <sub>2</sub> O <sub>3</sub> Ceramic Layer G.L. Pintilei, S.I. Strugaru, C.B. Papatoiu, C. Paulin, A. Bârcă and C. Munteanu	705
The Influence of Thermal Treatment upon Nanostructure and Composition of YZrO Based Ceramics Obtained by Atmospheric Plasma Spraying G.L. Pintilei, F. Brânza, V. Nica, S.I. Strugaru, E.S. Bârcă and C. Munteanu	711
Considerations on the Micro-Indentation and Differential Scanning Calorimetry of Arboform Reinforced with Aramid Fibres S. Plavanescu, D. Nedelcu and N.M. Lohan	718
Chapter 7: Maritime Engineering and Navigation	
Choosing the Optimum Method of Treating the Ballast Water Onboard Ships N. Acomi, O.C. Acomi, A.L. Bostina and A. Bostina	727
Hertz Contact Problem between Wheel and Rail T. Axinte	733
<b>Analysis of Rails of a Ferry Boat under Wheels Contact Loading</b> T. Axinte	739
Statistical Model for Ultra-Wide Band Radio Channels Onboard Ship D. Deacu	745
A Study Initiated because of the Global Warming from R-134a F. Memet and D.E. Mitu	751
<b>Processing of the Data Obtained with the Advanced Doppler Velocymeter</b> F.V. Panaitescu, D. Deleanu and M. Panaitescu	757
Energy Review on a Maritime Energy Transfer System for Comercial Use A. Preda and A.A. Scupi	763
Modern Education Facilities for CAD/CAM/CAE Training of the Future Maritime Engineers  A. Raicu and E. Oanta	769
Comparative Analysis of Tanker Ships Incidents and their Environment Impacts R. Tromiadis and C. Stanca	775

Applying Determination Models for Human Errors in Sequential Analysis of Maritime	
Accidents R. Tromiadis and R. Hanzu-Pazara	780
Transshipment Modeling and Simulation of Container Port Terminals E. Roşca, Ş. Raicu, M.A. Roşca and Ş. Burciu	786
Different Methods of Refloating a Ship A. Varsami	792