## **Table of Contents**

**Preface** 

Chapter	1:	<b>Additive</b>	Mai	nufact	uring
---------	----	-----------------	-----	--------	-------

<b>Analysis and Testing of Infills of 3D Printed Specimens with Varying Infills</b> S.M.H. Gillani and G. Balogh	3
Measurement and Testing of the Effect of Infill on Additively Manufactured TPU Part A. Tahmid, G. Balogh and S.M.H. Gillani	19
Integration of Machine Learning in Additive Manufacturing for Material Extrusion and Powder Bed Fusion, a Brief Literature Review A. Debreceni and S. Bodzás	27
Optimization of Lightweight Components through Hybrid Topology Optimization and Generative Design in Additive Manufacturing O. Lkadi, M. Nassraoui and O. Bouksour	33
Chapter 2: Machining and Forming	
<b>Analysis of Grinding Technology of Spiroid Worm on a Classical Grinding Machine</b> S. Bodzás	45
Dependence of Quality and Productivity on the Type of Wire Electrode in WEDM of HSS L. Straka and J. Hajduk	55
Evaluation of Thickness Distribution during Single Point Incremental Forming of Pure Aluminum Alloy Al1050 M. Habbachi, P.Z. Kovács and A. Baksa	63
<b>CAD Modelling and 3D Scanning of the Elements of the Wire Bending Mechanical Machine</b> I.M. Mokaya and S. Bodzás	71
CAD Modeling and Surface Roughness Measurement of the Gear Pair in the Wire Bending Machine I. Ennamouss and S. Bodzás	83
Chapter 3: Joining and Casting	
Comparative Analysis of Plasma and Tig Welding on Mild Steel Bars C.D. Nkalanga and P. Sándor	93
Conditions Forming to Blow-Hole Defects in Casting L. Mádi and D. Molnár	103
Literature Review of the Behaviour of Adhesive Joint Fatigue Performance P. Péczi-Kovács, Z. Weltsch and M. Berczeli	113
Numerical Simulation of Residual Stresses Induced by MIG Welding Considering Initial Conditions	
M. Alhafadhi, M.A. Shehab, M. Alsigar, S.S. Kumar, S.S.S. Elfallah, A.A.A. Sahm and M.H.F. Helal	123
Chapter 4: Polymer Engineering	
<b>Degradation of Bioplastic TPS Composite with Natural Fillers</b> M.J. Tóth and A. Polyákné Kovács	135
Effects of HDPE-g-MAH on Mechanical and Thermal Properties of Recycled rPET/rHDPE Blends D. Gere	147
Investigation of Behavior of Aliphatic Polyketone under the Effects of Recycling and UV A. Polyákné Kovács, S. Hajialilou, M. Tomin, Y.F. Minale, B. Gyore and T.J. Szabó	157

A Novel Air-Flow Electrospinning Setup for Controlling Fiber Distribution and		
Morphology K.K. Abdullah and K. Molnár	169	
Chapter 5: Mechanics of Materials and Tribology		
Investigation of Miniaturized Tensile Test Specimens Manufactured by Casting D. Varga and A. Szlancsik	179	
The Influence of Chemical Composition on the Mechanical Properties of Sintered Carbides L. Straka and A. Zalyvchyi	187	
Establishing a Tribo-System to Study the Frictional Effects of Lunar Regolith B. Turapov, G. Kalacska and R. Keresztes		
Experimental and Numerical Analysis of Hail Impact on Sheet Molding Compounds A. Kapshammer, M. Lackner, M. Leibetseder, T. Mankovits and Z. Major	205	
Chapter 6: Applied and Computational Mechanics		
Critical Buckling and Damage Analysis of Hybrid Composite Panels with Cutouts under Uniaxial Compression Loading	215	
M.M. Rahman and S. Szabolcs  Determination of Von Mises Stresses in Elliptical Cross-Sections  A. Baksa and I. Ecsedi	217 227	
Improving Discrete Numerical Methods for Dynamics Using Continuous Mathematical Tools		
D.M. Takács and T. Fülöp  A Localized Method of Fundamental Solutions for the Stokes Equations	235	
C. Gáspár Mathematical Analysis of Contact Problems in Nonlinear Electro-Viscoelastic Materials	245	
with Damage and Electric Interactions M. Chegaar	255	
Comparison of Turbulence Models in the Simulation of Fluid Flow in Corrugated Channel A. Tanougast and K. Hriczó	267	
Chapter 7: Machine and Product Design		
Design for Modularity (DFM) Theory and Practice Modular Design of Giant 3D-Printer and 3D-Printed Products	•04	
V. Gotthard  New Design Solution of Reference Device with Model Eye  L. Buldé L. Laire & Dunci A. Smotterlan and B. Ondore	281	
J. Rybář, J. Leja, Š. Dunaj, A. Smetánka and P. Onderčo  An Overview of the Development Process of Universal Gear Reducers with External Helical	295	
Gears M. Rackov and S. Kuzmanovic  Story for the Lambary station of Faving and On spating on the Principle of Theory of Daving	301	
Steps for the Implementation of Equipment Operating on the Principle of Thermal Drying for the Disposal of Waste Water and Bio-Waste Generated on Cruise Ships A. Kári-Horváth, Z. Lantos, Á. Sztancsek and G. Kristóf	311	
Predicting Remaining Useful Life Using AdaBoost Algorithm O. Hornyák	321	
<b>Manufacturing and Assembling the Components of a Mechanical Seal Testing Bench</b> M. Kiss, G. Kalacska and R. Keresztes	329	
Chapter 8: Robotics, Mechatronics and Automation		
Improvement of Physical Security through Continuous Authentication for SCADA and DCS Systems in Industrial Automation and Control Systems		
I. Denes and S. Semperger	337	

Simulation of the Value Stream in the Field of an Industrial Process Using Visual Components	
G. Ruzicska and L. Czégé	343
Relation between the Cutting Force and the Current Consumption of the BLDC Motor in a Hedge Cutter B. Siktár, G. Hegedűs and J. Kakuk	353
Frequency Response Optimization of an Industrial Robot Arm D. Bodnar and K. Jármai	361
	• • •
Chapter 9: Engineering and Industrial Measurements and Testing	
Discrete Wavelet Transform and Multiresolution Analysis for the R-Peak Detection of the QRS Complex of ECG Signals K. Deák	373
Influence of Surface Roughness on the Accuracy of Dimensional Measurements in X-ray Computed Tomography (CT): A Study on 3D-Printed Workpieces Á. Loránd and Á. Drégelyi-Kiss	383
Novel Coupled Simulation Method and Comprehensive Metrology to Enhance the Application of Prototype Injection Moulds S. Krizsma and A. Suplicz	393
Improve the Practical Usability of Ballbar Machine Tool Verification D. Ledenyák, T. Rosta and M. Andó	403
Determination of Natural Frequencies with Acoustic Methods and their Relation to Residual Stress	412
A. Kiri and Z. Weltsch	413
Chapter 10: Artificial Intelligence in Engineering Research	
AI Based Digital Image Processing A.K. Varga	421
Using Machine Learning Models to Predict and Reduce Noise Levels in Gear Systems K. Horvath and A. Zelei	429
Chapter 11: Engineering Management	
Safety Challenges of Hydrogen Fuelling-Station G. Hasulyó and M. Vadászi	439
Analysis of the Feasibility of Integrating Electric Vehicles into Vehicle-to-Grid Systems in Hungary	
J. Menyhárt, J. Kertész and P. Szemes  Implementing Lean Tools to Improve a Production Line in a Given Company	449
A. Sahab, M. Ebrahim and D. Miklós  Integrating Material Handling Machines into an AI-Focused Framework  G. Bohács and H.M. Sadida	457 477
The Roles of Electromobility and Logistics in Finished Product Distribution Literature Review with PDSA-Based Testing Protocol	4//
J. Juhász	485
Integrating Robotics, Logistics, and Programming in STEM Education E.B. Varga and A. Baksa	497
Chapter 12: Environmental Management and Waste Management	
Optimizing Inter-Basin Water Transfer for Sustainable Energy Management and Multipurpose Water Utilization A. Kálmán, A. Bakonyi, M. Chappon and K. Bene	511
v · · · · · · · · · · · · · · · · · · ·	

Change in Concentrations of Groundwater Pollutants in a Recultivated Non-Hazardous Landfill with a Temporary Top Cover Layer	
I. Angerer-Petrovickijne	525
Innovative Use of Textile Waste for Automotive Applications M. Ozcanli, B. Karacor, B. Zervent Ünal and A. Çalik	533
<b>Investigating the Impacts of Slag Contents on the Thermal Characteristics of Foam Glasses</b> A.A. Usman and P. Csaba	539