

62nd International Conference of Machine Design Departments (ICMD 2022)

Atlantis Highlights in Engineering Volume 28

Harrachov, Czech Republic
13 - 15 September 2022

ISBN: 978-1-7138-9811-5

Printed from e-media with permission by:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Print copyright© (2024) by Atlantis Press (part of Springer Nature)
All rights reserved.
Copyright for individual electronic papers remains with the authors.

For permission requests, please contact the publisher:

Atlantis Press
Van Godewijckstraat 30
3311GX Dordrecht
The Netherlands

contact@atlantis-press.com

Printed with permission by Curran Associates, Inc. (2025)

Additional copies of this publication are available from:

Curran Associates, Inc.
57 Morehouse Lane
Red Hook, NY 12571 USA
Phone: 845-758-0400
Fax: 845-758-2633
Email: curran@proceedings.com
Web: www.proceedings.com

TABLE OF CONTENTS

SESSION: ENGINEERING ANALYSIS

A Three-Dimensional Crack Under Complex Loading Conditions.....	1
<i>Reza Jalayer, Majid R. Ayatollahi, Behnam Saboori</i>	
Decrease in the Roughness of the Shaft Surface During Application of the Clamping Sleeve	9
<i>Lukáš Hruzík, Květoslav Kaláb, Jiří Struž</i>	
Analysis of Output Oil Yield and Energy Utilization of Bulk Pumpkin Seeds Under Constant Loading.....	19
<i>Emir Asyraf Agus, Je Zen Cheong, Nor Hafiy Adli Razali, Abraham Kabutey, David Herák, Idris Bin Ismail</i>	
BLDC Motor Analysis in Software ANSYS Electronics.....	26
<i>Jakub Eichler, Tomáš Zvolský</i>	
Resolving a Problem with Cleaning of Tools by the 3I Method – a Case Study	34
<i>Vladimir Sojka, Petr Lepsík</i>	
Application and Explanation of General Geometrical Tolerances According to ISO 22081	41
<i>Karel Petr</i>	
Interpretation of New Rules for Using of General Geometric and Dimensional Specifications in Drawings According to International Standard	50
<i>Bronček Jozef, Drbúl Mário, Konstantová Viera, Daniel Čuchor</i>	
Vibration Analysis of Multifunctional Laminated Glass Composite Panel	61
<i>Reza Moezzi, Jindrich Cyrus, Jan Koci</i>	
Cracking in the Modular Belt for Spiral Conveyors in Real Operation.....	73
<i>Josef Vašata, Ladislav Ševčík</i>	
Mathematical Model of Technical System in SimScape	85
<i>Jozef Jenis, Jozef Ondriga, Patrik Kováčik, Matúš Čuchor, František Brumerčík, Slavomír Hrček</i>	
Model Simulation of Reconstructed Fiber Yarns.....	98
<i>Josef Vosáhlo</i>	
Model Reconstruction of Fiber Yarn from CT Images	107
<i>Josef Vosáhlo</i>	
Mathematical Analysis of Propeller Flight Simulation.....	117
<i>Jakub Fiačan, Slavomír Hrček, František Brumerčík, Jozef Ondriga, Ján Steininger, Pavol Michal, Zdenko Šavrnok</i>	
Modelling the Winding of Composite Frames for the Automotive Industry	126
<i>Jaroslav Mlýnek, Roman Knobloch</i>	
Numerical Analysis of the Velocity of Abrasive Particles in an Abrasive Blasting Device.....	133
<i>Josef Vosáhlo, Pavel Srb</i>	

Investigation of Washer Influence on Bolt Connections in Non-Ferrous and Non-Metal Constructions.....	141
<i>Radka Jírová, Lubomír Pešík, Josef Vosáhlo</i>	
Force Analysis of Bevel Gears in Milling Head Drive and Design of Bearings.....	147
<i>Vojtěch Dinybyl, Eva Kubec Krónerová, František Starý</i>	
Calculation of Coordinates of an Internal Gearing Fillet Manufactured by a Pinion-Type Shaper Cutter with Rounded Tip	158
<i>Miloš Němček</i>	
The Emission Impact of the Innovative Grate Shape in the Fireplace Stove and Comparison with the Car	166
<i>Josef Hykl</i>	

SESSION: MACHINE DESIGN

LiDAR Localization in Rugged Environment.....	177
<i>Ekaterina Nyrobotseva, Josef Černohorský, Nestor Arana-Arexolaleiba</i>	
Effect of Blade Pitch Angle on a 2-Bladed Horizontal Axis Tidal Current Turbine Performance.....	187
<i>Ramin Alipour, Roozbeh Alipour, Farhad Fardian, Seyed Saeid Rahimian Koloor, Reza Moezzi</i>	
Spiral Conveyor Commissioning.....	200
<i>Josef Vašata, Ladislav Ševčík</i>	
Design of Traction Battery for Autonomous Vehicle.....	207
<i>Lukas Krcmar, Pavel Jandura, Martina Ryvolova</i>	
Concept of Autonomous Vehicle Control and Data Acquisition.....	218
<i>Jaroslav Hlava, Jindřich Cýrus, Daniel Kajzr, Jan Kočí</i>	
Electronic Pourer	228
<i>Jiří Rejnart, Ladislav Ševčík</i>	
Frequency Regulation of the Clamping Plate in Dynamical Tests	234
<i>Radka Jírová, Lubomír Pešík</i>	

SESSION: OPTIMIZATION AND DESIGN

Study on Composite Material Structure Profile Design in Electric Vehicle Application.....	239
<i>Aleef Shah Fanil Shah, Muhamad Fauzi Abd Rased</i>	
An Innovative Solution to Optimize Ultrasound Diagnostics by Introducing a Portable Ultrasound Device to the European Medical Market	245
<i>Olga Paraska, Andriy Gorban, Oleh Dynnyk</i>	
Interpretation of Biomimetic Principles in the Construction Design Process of Small and Light Electric Vehicles	254
<i>Igor Gajdáč, Viera Konstantová, Štefan Medvecký, Tomáš Gajdošík</i>	
The Differences in Geometry Modifications Methods After Topological Optimization	265
<i>Jiri Struz, Lukas Hruzik</i>	

Composite Frame of the Electric Car Body with Inserts M8_5 BN 4575	276
<i>Ladislav Ševčík</i>	

SESSION: MODERN TECHNOLOGY

Sandwich Structured Carbon Fiber Composites with Enhanced EMI Shielding Performance	281
<i>Shi Hu, Dan Wang, Josef Vecernik, Dana Kremenakova, Jiri Militky, Michal Petrů</i>	
Approximate Functions for Geometric Constants of the Rectangular Cross-Section in Torsion.....	291
<i>Oldřich Dajbych, Abraham Kabutey, David Herák, Aleš Sedláček</i>	
Concept Design of a Power Plant Using Algae Biofuels	298
<i>Petr Buzek</i>	
A Review: Thermoplastic Composites in Aerospace Applications.....	305
<i>Akshat Tegginamath, Michal Petru</i>	
Review: Composites Used in Aircrafts.....	313
<i>Akshat Tegginamath, Michal Petru</i>	
Preparation of Synthetic Data to Be Used as Inputs for Neural Network Using CAD System	320
<i>Jozef Ondriga, Jozef Jenis, Jakub Fiacan, Slavomir Hrcek, Michal Lukac</i>	
Control Unit of the Autonomous Electric Platform	331
<i>Petr Bílek, Ondřej Mach, Pavel Jandura</i>	
Li-Ion Battery Cell Aging Observation Based on Impedance Spectroscopy	339
<i>Miroslav Novák</i>	
Automated Processing of Experimental Data and Reports Using Free Software	352
<i>Eliška Cézová</i>	
Influence of Fly Ash Fillers on Impact Resistance of Epoxy Matrices	364
<i>Mohanapriya Venkataraman, Jiří Militký, Vijay Baheti, Alžběta Samková, Jana Novotná, Michal Petrů</i>	

SESSION: EXPERIMENTAL METHODS

Development of the Modular DC Fast Charging Station for Electric Vehicles	372
<i>Lukáš Hubka, Petr Školník, Jiří Kubín</i>	
Experimental Investigation of Machinability of the Hybrid Fibre Reinforced Epoxy/Polymer Composite.....	384
<i>Martina Ryvolová</i>	
Measurement of Transfer Function During Multi-Axis Loading	393
<i>Ales Lufinka</i>	
Evaluation of Tribological Properties of Thin Coatings Formed by Solid Lubricants	401
<i>Matúš Čuchor, Jozef Bronček, Marián Dzimko, Jozef Jenis, Michal Lukáč</i>	
Testing of Axleboxes for Railway Vehicles on the TBRB 01 Test Bench in Accordance with EN 12 082.....	410
<i>Ján Šteiningger, Slavomír Hrček, Igor Gajdáč, Peter Spišák, Jakub Fiacan</i>	

Thermochromic and Electrical Properties of silica/DEA-CuCl ₄ sensory Composite	423
<i>Hana Křížová, Michal Krejčík, Marcela Škodová, Zuzana Hrubošová</i>	
Investigation of Temperature Change for Two Flexible Pneumatic Elements Dynamically Loaded	431
<i>Jozef Krajňák, Lucia Žuľová, Matúš Kačír</i>	
Vibration Assessment of Ski Lift Gearbox	440
<i>Elias Tomeh, Martin Mazač</i>	

Author Index