

## CONTENTS

### Artificial and Computational Intelligence Control, Informatics and Robotics

**Integrating AI-driven deepfake generation with IoT surveillance systems: A structured framework for synthetic media creation**

Vatsavayi Valli Kumari, Revathi Lavanya Baggam

**Enhancing transparency and user-interactivity in sentiment analysis design through X-OODM**

Abqa Javed, Muhammad Shoaib, Abdul Jaleel, Salman Jan, Ahmed Alkhyat, Ali Samad

**Potential of quantum machine learning for processing multispectral Earth observation data**

Manish K. Gupta, Michał Romaszewski, Piotr Gawron

**Combining improved generative adversarial networks for end-to-end traffic object detection under complex illumination conditions**

Yang Liu, Zhe Gong, Yuyang He, Weiqin Li

**Parametric design for sustainable marine infrastructure**

Hassan Abdolpour, Maciej Marut

**Interpretable machine learning for battery health insights: A LIME and SHAP-based study on EIS-derived features**

Taha Etem

**Flower pollination algorithm optimization applied for Lyapunov-based fuzzy logic speed controller of a complex drive system**

Grzegorz Kaczmarczyk, Radosław Stanisławski, Łukasz Knypiński, Danton Diego Ferreira, Marcin Kamiński

### Biomedical Engineering and Biotechnology

**Acrylic resins for manufacturing dental prosthetic restorations – microstructural, micromechanical and tribological tests**

Łukasz Bojko, Paweł Pałka, Anna M. Ryniewicz, Wojciech Ryniewicz

### Civil Engineering

**Pile-base resistance formation in natural-scale field conditions**

Paweł Siemaszko

**Usability of microstructural investigations of concrete-like composites; aggressive factors monitoring**

Filip Chyliński, Lech Czarnecki, Thomas Mathia

**Recycled polymer fibers in cement composites for sustainable construction**

Tomasz Walerus, Mateusz Moj, Bartłomiej Bodak

**Quantitative and qualitative analysis of hazardous events in the construction sector: causes, classification and implications**

Zuzanna Woźniak, Bożena Hoła

**Fatigue life assessment of steel connectors in the adjustable column-base connection for high-speed rail**

Piotr Kozioł

**Research on a method for capturing bullets with limited deformation for forensic comparative examination**

Dawid Pacek, Przemysław Badurowicz, Roman Gieleta

### Control, Informatics and Robotics

**The fractional, multi-order, reduced model of the one-dimensional heat transfer process**

Krzysztof Oprzękiewicz

**On optimising the solution for evaluation of scientific quality in Polish higher education system using a 2D cutting problem representation**

Dariusz Horla

**Wind power prediction in Poland using temporal fusion transformers and numerical weather prediction**

Weronika Jachuła, Michał Wydra

**Lossless image compression method using vector quantization based on minimizing mean absolute error**

Małgorzata Frydrychowicz, Grzegorz Ulacha

**Multimodal drone swarm for search and rescue mission**

Antoni Kopyt, Anna Czaplińska

**Smart parameterisation for energy-efficient public buildings**

Beata Kluczberg, Marek Maj, Robert Geryło

### Material Science and Nanotechnology

**Tribological properties of plasma sprayed NiAl-Ag-Ta-Cr<sub>2</sub>O<sub>3</sub> composite lubrication coatings from room temperature to 750 °C**

Chengqi Yan, Xiaopeng Miao, Zhuying Jia, Fei Zhao, Yong Zhang

**Investigation of the ability to manipulate light polarization properties in a liquid crystal cell filled with ferroelectric material through electric and magnetic fields**

Joanna Korec-Kosturek, Michał Niewczas, Jerzy Dziaduszek, Przemysław Kula, Rafał Zbonikowski, Jan Paczesny, Karol A. Stasiewicz

**Metalorganic vapour phase epitaxy of GaN-based structures grown on etched and non-etched Si(111) substrates for piezoelectric component separated devices**

Mateusz Wosko, Bartłomiej Paszkiewicz, Bogdan Paszkiewicz, Grzegorz Ilgiewicz, Iwona Sankowska, Regina Paszkiewicz

**Levitation of permanent magnet ball**

Dariusz Spałek

### Mechanical and Aeronautical Engineering, Thermodynamics

**Analytical solution of Atangana-Baleanu fractional viscoelastic relaxation model – Laplacian approach**

Muhammad Sabeel Khan, Ayesha Sagheer, Zarafshan Azeem

**An innovative pendulum-based absorber exploiting time-varying mass dynamics for vibration damping**

Bogumił Chiliński, Rafał Kwiatkowski, Krzysztof Twardoch, Anna Mackojć

**Full floating structure underwater explosion with pulsation and cavitation effect FEM simulation case**

Leszek Flis

### Power Systems and Power Electronics

**Influence of rivet material and squeeze force on the riveting process and residual stresses in riveted joints used in aircraft structures**

Adam Korbel, Valeria Manitcaia, Tomasz Machniewicz

**Numerical simulation of transient startup characteristics in pump-driven two-phase flow systems**

Nianyong Zhou, Jing Li, Jixiang Liu, Kaiming Liu, Feifei Wang, Lianghai Liu

**Transient analysis of electrodynamic forces in low-voltage compact busbar**

Michał Szulborski, Sebastian Łapczyński, Paweł Szulborski, Łukasz Kolimas, Przemysław Berowski, Maciej Owsiański

**Direct speed finite control set model predictive control for PMSM drive – robustness analysis**

Hubert Lisiński, Tomasz Tarczewski

**Study and design of a coaxial magnetic gear with a high torque density in telescopic camera cranes**

Piotr Warmuzek, Janusz Kołodziej, Marcin Kowol