

Table of Contents

Preface

Chapter 1: Modelling and Research in Mechanical Engineering

Simulation and Uncertainty Analysis of Buckling Behaviour of Thin Cylindrical Shell under Compression A.H. Samsudin, F.N. Md Nordin, M.S. Ismail and H.Q. Nguyen	3
Hydrogen Fuel Cell Commercial Vehicles: A Comparative Review of Sustainable Freight Transport G. Manar, M.S. Abu Bakar, R. Mohd Sohaimi, M.I. Najeeb, M.A. Mohammad Rizal and H. Ya	11
Heat Loss Parametric Study on Laminar Flow in a 3-Dimensional Rectangular Heating Duct in Cold Weather A. A. Gari	33

Chapter 2: Aerospace Engineering

Noise Reduction of Jet by Passive Control F. Mwiya, L. Dereje Futaza, W. Simwila Kalunga, A. Rout, D. Singh Chand, Y. Alemayehu and P. Jadhav	43
Design and Trails on Ionic Plasma Thruster for Aerospace Applications Y.P. Sai and K.S. Supen	53
Finite Element-Based Structural Integrity Assessment of a Payload Chassis: A Material Trade-Off Study for PSLV Launch Conditions N. Pawar, N. Navle, A. Joshi, D. Gharpure and S. Ananthkrishnan	63

Chapter 3: Robotics and Mechatronics

A Systematic Review on Bioinspired Robotic Grippers and Manipulators A. Zakir, H. Masood, B. Yadav, S. Sharma, A. Surya Kamal and P. Bhati	75
Development and Simulation of an Algorithm for UAV Swarm Coordination and Collision Avoidance S.D. Iyaghighba, O.S. Asere, A. El-Suleiman, A.J. Ukim and S. Thomas	91
Toward a ML Framework for Multisensory Human Health and Awareness F.A. Oteikwu, O. Ejodame and N. Osa-Uwagbue	121
Fit-Track: Edge-Intelligent Device-Free and Battery-Free Fitness Tracking S. Dayo Adesola, A. Said and U. Saleh Toro	131
Piezoelectric Foot Mat Energy Harvesting for Low-Power Applications: Exploring the Impact of Weight Distribution and Step Frequency I. Abdulwahab, A.J. Aliyu, P.E. Peter, Y.S. Abu, D.E. Abah and N.A. Iliyasu	143
Adaptive Neural Network-Based Feedforward-Feedback Controller for Nonlinear Dynamic System K.W. Olalere, B.T. Abubakar, B.G. Izuwunum, I. Ijeoma, E.R. Kwetishe, O. Adediran, O.A. Osanaiye and T.S. Ogedengbe	153
Top-Level Structural and Mechatronic Design of a 6WD Outdoor Autonomous Delivery Robot with a Redesigned Adaptive Climbing Rocker-Bogie Suspension C. Ndupu Sixtus, F. Usman Abdullahi, D. Magaji, N. Obadiah Ali and T. Sadiq	169
Reduction of Path Length of Notable Path Algorithms Using the KNS Algorithm K.C. Ugwoke, N.N. Agwu and S.E. Abdullahi	187
Enhancing Energy Harvesting from Low-Frequency Vibrations via Topology Optimization of Bimorph PVDF Cantilevers P.M. Aguilar, L.D. Rayos Del Sol and C.C. Mercado	199

Comparative Study of YOLOv5, YOLOv8, and YOLOv11 for Dust Detection in Voice Coil Motor Assembly K. Chaiyasin, V. Phunpeng, S. Khaengkarn, K. Khodcharad and T. Hengmeechai	207
Development of Workpiece Positioning System for Machining Micro-Pits of Hip Implant A. Yahya, N. Humaimi, K. Nugroho, Z. Khudzari and J. Puspanathan	213

Chapter 4: Precision Manufacturing Processes

Elimination of Bond Pad Crack through Application of Initial Force via Force Profiling on Sensitive Bond Pads G.C. Miranda	223
Modeling and Investigation of 3D Printing Parameters on the Melt Flow Behavior of Polylactic Acid P. Suttipong, C. Aumnate, J. Suk-Em and J. Tungtrongpairoj	229

Chapter 5: Construction Technologies

Application of Geopolymer Technology and Pile Raft Foundation in a Soil, Review Study Z.R. Najee, M.J. Al Waily and Z.F. Jawad	237
Enhancing the Sustainability of Road Projects Using Innovative Soil Stabilization Solutions T.M. Al-Asedi and M.J. Kadhim	245
Sustainability Assessment of Concrete vs. Steel Structural Systems: A Case Study on a Two-Story School Building B. Abdulhadi, A.H. Abd Ulameer, A.A. Hussein, M.M. Hasan and M.A. Razouki	253

Chapter 6: Advanced Approaches to Infrastructure Objects Research and Design

Structural Damage Prediction of a Concrete and Steel Bridge Using Acceleration Signal Processing and Artificial Intelligence Algorithms N.X. Diaz, A.W. Ortega and R.M. Delgadillo	263
Welding Procedure Effect on the Hydrogen Diffusion Behavior and Hydrogen Embrittlement Susceptibility of Welded Joint for Hydrogenation Reactor G.X. Cheng, W.C. Song, S.Y. Hu, S.W. Tu and H.J. Hu	269
Geological, Geophysical and Hydrological Controls on Sinkhole Formation in Saudi Arabia: Linking Karst Processes to Anthropogenic Impacts A.N. Qadrouh, S. Alkhairy, K.S. Aldamegh, M. Alotaibi, S.S. Eshily, A.H. Alghamdi and M.M. Alyousif	277