

Table of Contents

Preface

Chapter 1: Functional Materials

Experimental Insights into Rutting and Stripping Resistance of Sisal Fiber Reinforced Asphalt Layers A.I. Al-Safar and A. Alzerjawi	3
Use Liquid Crystals to Enhance the Efficiency of the PV T.N. Jamil, A.F. Hassan, A.H. Kareem, N.N. Hussein, T.F. Deindee, A. Taha and L.F.A. Al-Barram	11
Synthesis and Characterization of ZnMn₂O₄ for Gas Sensing Application Using Pulse Laser Deposition Technique A.I. Faris, H.H. Khudher, R. Ahmed, M.M. Abood and J.A. Abd	19
Photosynthetic Responses of Mangrove Plant (<i>Rhizophora apiculata</i>) to Elevated Atmospheric CO₂ Concentration B. Tamimi, A.S.H. Hamza Al-Shamry, W.J. Wan Ahmed, M.N.M. Said and C.R. Che Zain	31

Chapter 2: Composites

Modal Analysis of Composite Laminated Shell Reinforced by Crumbed Rubber Particles F.R. Abass, N.K. Abd-Ali and M.A. Kadhim	45
Experimental and Numerical Investigation of Transient Response for the Specific Rubber Compound N.K. Abd-Ali, A.R. Madeh, M.A. Kadhim and H.A.H. Alaasam	53
Numerical Investigation of the Modal Analysis for Multi Layers Composite Plate A.R. Madeh, N.K. Abd-Ali and M.M.M. Sherazi	64

Chapter 3: Mechatronics

Internet of Things Applications Using Heterogeneous VANET Architectures: A Review of the Challenges, Advancements, and Issues F.G. Abdulkadhim, H. Ali and A.A. Shukur	77
Review of Common Types Regenerative Braking System in Cars K.H. Ali, S.H. Bakhy, Z.S. Idan, E. Njim and F.T. Al-Maliky	90
Developing an Alarm System Using Arduino Technology R.S. Jabar, Z.K. Jabber, N.T. Ali, A. Ghandour, H.H. Abd-Alabas and Z.S. Idan	114
Fuzzy Gupta Transform, and its Applications A.H. Jaber, S.T.A. Alshibley and M.M.M. Sherazi	124

Chapter 4: Communication Engineering

Hybrid Bio-Inspired Algorithms for Energy Efficient and Optimal Communication in Mobile Wireless Sensor Networks: Review M.F. Alomari, R.A. Hasan, S.M. Rasool, M.M.M. Sherazi and A. Saad	135
Design a Simulation System for Data Transmission in Order to Obtain Best Values for the Laser Power Used H.J. Hasan and M.M. Abood	155
Assessing the Performance of Standard Mobility Models in Cellular Networks for Drones H. Ali, F.G. Abdulkadhim, K.E. Alhamami, R. Gafel, A. Ayad Kdham, S. Ahmed and D. Saleem	165

Chapter 5: Data Analysis

Development of a Group Decision Making Method for Ranking Alternatives: Selection of most Preferred Data Mining Algorithm for a Construction Project	
A. Al-Khafaji	177
Evolving Text Matching: A Systematic Review of Classical and Modern Approaches in the Neural Network	
N. Elmobark, A. Saad, A.A.T. Al-Khazalli and M. Badouch	195
The Hadoop Ecosystem: An Open-Source Framework for Enterprise-Scale Big Data Processing and Analytics	
N. Elmobark, A. Saad, S.H. Hasan and M. Badouch	210
EHD-ABC: An Enhanced History-Driven Artificial Bee Colony Algorithm for Improved Data Clustering	
H.A. Al-Kaabi, F.A. Al-Ibraheemi, H.A.H. Al Naffakh, M.R. Al-Rikabi and A.K. Jasim	227

Chapter 6: Cybersecurity

Advancements in Machine Learning-Based DDoS Attack Detection within Software-Defined Networking Environments	
K.E. Alhamami, H. Ali, F.G. Abdulkadhim, R. Gafel and A. Ayad Kdhm	243
Enhancing Medical Data Security in Private Cloud: An MAR-Based Encryption Approach	
F. Al-Ibraheemi, H.A.H. Al Naffakh, A.D. Radhi, B.A. Hakim and B. Al-Attard	254
Design a Framework to Protect the Algorithms for Blockchain Technology	
H. Hussein, A.F. Mahdi, F. Rabee and H.A.H. Al Naffakh	261
A Hybrid Intrusion Detection System for Smart Home Security Using LSTM and Autoencoder Neural Networks	
M.R. Jasim, S.H. Mahdi and H.A.H. Al Naffakh	277
Utilizing MD5 Hashing in Digital Forensics: A Comprehensive Analysis	
A.A.T. Al-Khazalli, A.A. Mohammed, P. Sumari, M.S. Dange, H. Jaber and M.M. Abd Zaid	295
Improving Network Security and Traffic Regulation through Deep Learning Systems	
N.R. Obeid, O.A. Obead, A. Al-Fatlawi and E.F.O. Al-Challabi	304