

2026 2nd International Conference on Computational Intelligence Approaches and Applications (ICCIAA 2026)

Amman, Jordan

12-14 May 2026

Pages 1–648

IEEE Catalog Number:
ISBN:

CFP260F7-POD
979-8-3315-5660-0



Copyright © 2026, IEEE

All Rights Reserved

Copyright and Reprint Permissions:

Abstracting is permitted with credit to the source. Libraries are permitted to photocopy beyond the limit of U.S. copyright law for private use of patrons those articles in this volume that carry a code at the bottom of the first page, provided the per-copy fee indicated in the code is paid through Copyright Clearance Center, 222 Rosewood Drive, Danvers, MA 01923.

For other copying, reprint or republication permission, write to IEEE Copyrights Manager, IEEE Service Center, 445 Hoes Lane, Piscataway, NJ 08854. All rights reserved.

*** This is a print representation of what appears in the IEEE Digital Library. Some format issues inherent in the e-media version may also appear in this print version.

IEEE Catalog Number:	CFP260F7-POD
ISBN (Print-On-Demand):	979-8-3315-5660-0
ISBN (Online):	979-8-3315-5659-4

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
E-mail:	curran@proceedings.com
Web:	www.proceedings.com

TABLE OF CONTENTS

Emperor Penguin Colony Driven Hyperparameter Search for IoT Intrusion Detection	1
<i>Tahani Mohammad Al-Mezead, Akram Aref Hamarsheh</i>	
A Systematic Review of Generative AI Applications in Process Mining: Techniques, Challenges, and Future Directions	7
<i>Duaa Shahin, Eman Yasin, Lujain Ghaith, Abdullah Aref</i>	
QRphish: An Automated QR Code Phishing Detection Approach	14
<i>Ashraf S. Mashaleh, Hind Mousa Al-Hamadeen, Amjad Gawanmeh</i>	
From Ad-Hoc Pilots to Strategic Roadmaps: A Longitudinal Study of Amman's Smart City Governance	20
<i>Ali Al Maqousi, Eng. Lubna Al Huneiti, Andres Monzon</i>	
Intelligent Data Governance: Applying AI to Ensure Quality, Privacy, and Compliance in Business Intelligence	26
<i>Mohammad Al Khaldy, Ahmad Altarawneh, Ameen Shaheen</i>	
Kerberos-Blockchain Cross-Authentication: A Smart-Contract Framework for Vehicular Ad Hoc Networks (VANETs)	34
<i>Mohammad Alauthman, Amjad Aldweesh, Ahmad Al-Qerem, Ghadeer Albesani, Akram Mustafa Mouhammd Alkasassbeh</i>	
Artificial Intelligence-Driven Optimization of Renewable Energy Systems for Sustainable Power Generation	41
<i>Ayoub Alsarhan, Mohammad Aljaidi, Wael Hadi, Mohammad Q. Al-Jamal, Mahmoud Al-Jamal Bashar Khassawneh, Ahmad Abdullah Alshammari</i>	
Federated Learning with Bayesian Optimization for Lightweight IoT DDoS Detection	49
<i>Mahmoud Aljamal, Mohammad Aljaidi, Wael Hadi, Zaid Jawasreh, Ayoub Alsarhan, Rejwan Bin Sulaiman Ahmad Abdullah Alshammari</i>	
A WEFE Nexus Capacity-Building Framework for Engineering and Computer Science Students: A Jordanian Case Study	57
<i>Nesreen Otoum, Rainer Herpers, Ali Shehadeh, Mohammad A. Alzubaidi, Mwaffaq Otoom</i>	
Remote Control of a Robotic Arm Based on Human Arm Motion Using Flex Sensors and MPU6050	65
<i>Mohammad A. Alzubaidi, Samar Al-Shboul, Amal Alzoubi, Deema Hindawi</i>	
Stroke Prediction with Explainable AI and PR-AUC-Driven Model Selection	70
<i>Mohammad Atallah Moh'd Al-Oudat, Enas Tawfiq Abusamra</i>	
Detecting DDoS: A Communication Efficient Approach in Distributed Environments	76
<i>Batool Armouti, Mouhammd Alkasassbeh</i>	
Blockchain Tamper Evident Telemetry for RPL IoT Security Analytics	82
<i>Hatem Mosa, Mouhammd Alkasassbeh</i>	
Machine Learning-Based Model for the Classification of Water Potability	90
<i>Mohammed Ramadan Ismail, Mohamed A. E. Abdalla, Mohammed Najy</i>	
Object Recognition Using a Hybrid CNN-Transformer Architecture	95
<i>Maria Yousef, Yazan Alaya Al-Khassawneh, Tuleen Qaryouti</i>	

AEGIS-Chain: Agentic AI for Auditable Human-in-the-Loop Supply Chain Decision Support	101
<i>Bilal Sowan, Ahmad Altarawneh, Mohammad Azzeh, Hazem Qattous</i>	
AI-Powered Smart Meeting Monitoring System for Hostility Detection	109
<i>Noura Alhammadi, Moatsum Alawida, Noora Salem Almansoori, Maryam AlMahri Khulood Khaled Basarda</i>	
Lane-Aware Traffic Congestion Classification for Autonomous Navigation Using Multi-Lane Microscopic Simulation Data	116
<i>Halima Herrie Hamedu, Mohammed Al-Hubaishi, Ibrahim Shoer</i>	
Distributed AI Vector Search with Data Sovereignty: Architectural Analysis and Scalability Characterization of Oracle Database Sharding	122
<i>Chaitanya Kulkarni, Chandrashekhar Medicherla, Bharadwaj Vulugundam, Siva Rama Krishna Varma Milan Parikh, Amit Kumar Padhy</i>	
From manual to AI: A systematic review of methodological evolution in social media content analysis	128
<i>Duha Alsmadi, Victor Prybutok</i>	
Optimizing Cloud Resource Allocation with Predictive Big Data Models	133
<i>Mohammad Al Khaldy, Amjad Aldweesh, Ahmad Al-Qerem</i>	
Lightweight Deep Learning Architectures for Edge Intelligence: Budget-Aware Compression–Architecture Co-Design	140
<i>Mohammad Al Khaldy, Ziadoon Otaiwi, Ahmad Al-Qerem</i>	
Feature Distillation Optimizes YOLOv7 for Robust Student Behavior Detection in Classroom Environments	147
<i>Lin Bin, Xiao Hongyun, Zhou Jiaying, Hai Tao, Yang Xiao</i>	
EEG-Based Harmful Brain Activity Classification with Hybrid 2D and 3D CNN Ensemble Architecture	153
<i>Onat Ender, Ömer Faruk Alkan, Enes Ayan</i>	
An Educational Framework for Using Artificial Intelligence Applications to Develop Early Language Skills among Preschool Children	159
<i>Ali Alkhdour, Ayah Alkhdour</i>	
Lightweight Deep Learning for Concealed Person Detection and Tracking in Airplane Cargo Holds	166
<i>Bachir Khalfi, Rim Gasmî</i>	
Optimizing Weighted Random Forests for Phishing Website Detection	173
<i>Hossam M. J. Mustafa, Sawsan Abu-Taleb, Muhannad Alkhalaileh</i>	
Comparison study of Feature Engineering, Stacking and Hyperparameter Tuning for Image Classification	180
<i>Hossam M. J. Mustafa, Sawsan Abu-Taleb, Muhannad Alkhalaileh</i>	
Assessing the Efficacy of Pre-trained Deep Learning Models for Facial Expression Recognition	187
<i>Maryam Alkandari, Alaa Eleyan</i>	
LLM-Based Stock Price and Volatility Prediction: A Multi-Modal Deep Learning Framework Integrating Financial News Sentiment and Technical Indicators	192
<i>Nghia Luong Van, Vinh Truong Hoang, Nghia Dinh, Huy Nguyen Quoc, Kiet Tran-Trung Tuan Truong Cong</i>	

Self-adaptive graph learning approach for Spectral Clustering with soft-label assignment	198
<i>Khoi Vo Huy, Vinh Truong Hoang, Thanh Duc Ngo</i>	
Graph Neural Networks for Structural Representation Learning of Zero-Divisor Graphs from Idealization Constructions	205
<i>Manal Al-Labadi, Wasim Audeh, Nazneen Khan</i>	
Hybrid Symbolic-Neural Framework for Predicting Zero-Divisor Geodetic Indices in Idealization Rings	211
<i>Manal Al-Labadi, Wasim Audeh, Enoch Suleiman</i>	
A Hybrid System Framework for Coronary Heart Disease Prediction using Machine Learning Techniques	217
<i>Lamido Yahaya, Abubakar Adamu, Bello Abdulkadir Rasheed</i>	
A Practical Conceptual AI-Driven Framework for Cybersecurity Threat Detection and Secure Deployment	224
<i>Albara Awajan, Sara Shatnawi, Jawaher Alsaket</i>	
Adaptive Resource Allocation in Edge Computing Using Intelligent System Response	232
<i>Jamil K. J. Bataineh, Rula M. Tawalbeh</i>	
Health Care Blockchain: A Prototype for Secure Medical Records Using Blockchain	237
<i>Adnan Shaout, Ritesh Revansiddappa Honnalli, Krina Trivedi, Vivek Reddy Pulakannti</i>	
ADHD Diagnosis Through Video Analysis Using Deep Learning Techniques	245
<i>Mutaz Momani, Raed Alazaidah, Anwar Katrawi, Amer Abu Salem, Mowafaq Salem Alzboon, Musab Iqtait</i>	
Artificial Intelligence Visual Studio Code Reviewer	253
<i>Adnan Shaout, Akshat Sikligar</i>	
An Interval-Valued Fuzzy Inference System for Disease Diagnosis	260
<i>Adnan Shaout, Sai Arunanshu Govindarajula, Neha Basugade</i>	
An Autonomous Line-Following Mobile Manipulator for Warehouse Pick-and-Place Using Event-Driven Vision	267
<i>Yara Altamimi, Hamza AbuSair, Hasan Al-Hasnawi, Omar Al-Dakker, Ahmad Rabia, Y. M. Al-Rawashdeh</i>	
ML in medical research: A bibliometric analysis of methodological evolution and clinical applications	274
<i>Duha Alsmadi, Gayle Prybutok</i>	
AI Readiness in Nutritional Healthcare: Evaluating Knowledge, Attitudes, and Adoption Practices Among Jordanian Nutrition Professionals	279
<i>Nour Elsahoryi, Omar Alhaj, Ruba Musharbash, Fadwa Hammouh</i>	
BiPAM: Bidirectional Parallel Attention-Mamba for Efficient Anomaly Detection in Industrial Control Systems	285
<i>Mohammad Alhadidi, Mouhammd Alkasassbeh</i>	
Differentially Private Intrusion Detection for Multi-Tenant Clouds via Objective-Perturbation Logistic Regression	291
<i>Omar A. Alzubi, Hussam N. Fakhouri, Hasan Kanaker, Jafar A. Alzubi</i>	

A Hybrid NIZKP and Schnorr's Protocol-Based Two-Factor Authentication for Secure and Scalable Healthcare Systems	297
<i>Bara'a O. Ghananim, Omar A. Alzubi, Wafa' Za'Al Alma'Aitah, Hussam N. Fakhouri, Hasan Kanaker Jafar A. Alzubi</i>	
Cost-Sensitive Phishing URL Detection for Cloud Email Gateways	303
<i>Faten Hamad, Hussam N. Fakhouri, Hasan Kanaker, Omar A. Alzubi</i>	
Metaheuristic Optimization of Authentication Thresholds	309
<i>Omar A. Alzubi, Hussam N. Fakhouri, Hasan Kanaker, Jafar A. Alzubi</i>	
A Review on Advancing Immersive Experiences through Animation Technology in Virtual Reality	315
<i>Faris Abuhashish, Mohammed Atoum, Waheeb Abu-Ulbeh, Isma H. Ismail</i>	
Improving Human Experiences with Computer Vision and Natural Language Processing	320
<i>Mahmoud Masadeh, Batool Al-Tellawi, Doa'a Mohammad Aloqoul</i>	
Bombardier Beetle Optimizer: A Novel Bio-Inspired Algorithm for Global Optimization	326
<i>Hisham A. Shehadeh, Mohd. Yamani Idna Idris, Iqbal H. Jebril, Hossam M. J. Mustafa</i>	
Multilingual Large Language Models for Low-Resource Languages: Challenges and Opportunities	334
<i>Mohammad Al Khaldy, Youcef Gheraibia, Ameen Shaheen</i>	
Explainable Reinforcement Learning for Automated Incident Response in Critical Infrastructure	341
<i>Mohammad Alauthman, Ammar Almomani, Ahmad Al-Qerem, Ghadeer Albesani, Mouhammd Alkasassbeh</i>	
AI-Enhanced BIM for Smart City SDGs: Governance and Environment Pillars	348
<i>Sadeen Alquran, Mohammad Alauthman, Amer Al-Jokhadar, Ali Al-Maqusi</i>	
Multi-Objective Bayesian Optimization of XGBoost for Imbalanced Molecular Classification Using RDKit Descriptors	354
<i>Ahmad Al Athamneh, Mahmoud E. Farfoura, Yazan S Batarseh, Saad Alnassan</i>	
Lightweight Machine Learning for Intrusion Detection in Zero-Trust Systems	360
<i>Yasmein Abaza, Hana' Alrashid</i>	
Multi-Sensory Virtual Reality Advertising: Integrating Brand Identity and Immersive Narratives for Consumer Engagement	366
<i>Mohamed Khairy Abd El Sadek Omar, Noha Salah El Sayed El Basyouni, Hamza Mohamed Khairy Omar Ahmed Husain Ibrahim Waseif, Deyaa Awed Ahmed Abo Elata</i>	
AI-Based Real-Time Predictive Modeling Using Streaming Data for Fraud Detection: A Novel Adaptive Ensemble Framework	372
<i>Nghia Luong Van, Vinh Truong Hoang, Nghia Dinh, Huy Nguyen Quoc, Kiet Tran-Trung Tuan Truong Cong</i>	
Predictive Modeling of Flavonoid-Mediated Wound Healing Using Machine Learning: A Preclinical Study	379
<i>Saja Khatib, Kenza Mansoor, Mohammad Arafah, Luay Abuqatouseh, Eyad Mallah, Feras El Hajji</i>	
Detecting Near-Drowning Behavior in Video Feed Using Convolutional Neural Network	387
<i>Sharief Kundo L. Mudrikal, Elouisa Joy A. Marcelino, Renald Ian V. Alama, Ranielle Dae A. Delos Reyes Odon A. Maravillas</i>	

Reimagining the "Smart People" Dimension: Jordan's Knowledge Stations and the Shift Toward AI-Ready Future Stations	393
<i>Ali Al Maqousi, Ammar Almomani</i>	
MENA-Twin: A Resilient Edge-AI Framework for Water-Energy Nexus Optimization in Arid Controlled-Environment Agriculture	400
<i>Ali Al Maqousi, Souad El Hajjaji</i>	
Artificial Immune System–Based Anomaly Detection for IoT Network Security	408
<i>Salam Al-E'mari, Yousef Sanjalawe, Fadi Fataftah</i>	
Expert Systems and Knowledge Representation in AI-Driven Decision-Making: A Comprehensive Survey	413
<i>Feda'a Al-Tawara, Mohammad Ahmad</i>	
Computational Analysis of Islamic Values in Digital Children's Programming: A BERTopic Study of Quranic Narratives on YouTube	419
<i>Ayah Wafiq Abdulraheem, Mahmoud Artemi</i>	
Adaptive Transformer-Based Neural Network for Robust Stereo Image Pair Rectification	426
<i>Wissam Alkhadour, Jawad Hasan AlKhateeb</i>	
Hybrid Essay Assessment Framework: Integrating Neural Content Analysis with Reference-Based Similarity Evaluation	431
<i>Eman Alduweib, Essa Hezzam, Mohammed Noman, Abdel Khalik Alhammouri</i>	
Explainable Dermatology using Mobile ViT Kan	437
<i>Oussama Bouldjedri, Ahmed Bali</i>	
Transformer-Enhanced Analysis of Employee and Customer Effects on Sustainable Environmental Management Systems in Chinese Hotels	443
<i>Cui Zheyuan, Nurul Fadly Habidin, Yang Xiao, Hai Tao</i>	
Automating Goal-Oriented Modeling with NLP: Extracting Actors, Roles, and Dependencies from Functional Requirements	449
<i>Touseef Tahir, Maham Shoaib, Mohammad Noman, Shakeel Ahmad, Shahan Ahmad Chowdhury Mohammad Ahmad</i>	
MSRFF: An Interpretable CNN–Vision Transformer Framework for Diabetic Retinopathy Detection	455
<i>Md Akash Rahman, Mahfuz Islam Khan Jabed, Rimon Kanthi Devnath, Chowdhury Mohammad Mehedi Manoara Begum, Tanjim Mahmud</i>	
Interpretable Machine Learning Analysis of Subjective Life Satisfaction: Age-Specific Nonlinear Effects from Japanese National Survey	462
<i>Yoshiyuki Suimon</i>	
Intrusion Detection and Attack Classification in IoT Networks Using Machine Learning	468
<i>Fatima Hassan, Ghazlan Al-Zarrouq, Rabia EmhamedAl Mamlook, Mohammad Aljaidi, Ola Nasir Wael Hadi, Taha Bzizi, A.M.Abu Abeid, Ali Saeed Almuflih</i>	
Robust Pixel Descriptors and Matching Strategies for Accurate Stereo Correspondence in Challenging Environments	475
<i>Wissam Alkhadour, Jawad Alkhateeb</i>	

The Impact of Artificial Intelligence Applications on Visual Effects Workflows in Virtual Reality Animated Visual Presentations	480
<i>Mansour El Sherif, Maha Nasr Mohamed Mansour</i>	
Learning Analytics for Dual Education: A Privacy-Preserving Framework Bridging Campus and Workplace Competencies	487
<i>Mohammad H. Abu-Arqoub, Amal Shafiq Abdulla, Ali A. Titinchi, Rashiq Rafiq Marie</i>	
Med-MuZero: A Model-Based Reinforcement Learning Approach for High-Accuracy Medical Image Diagnosis	495
<i>Mahmoud Baklizi, Mohammed Atoum, Isma H. Ismail</i>	
Hybrid PSO–ELM-Based Clinical Decision Support for Heart Disease Diagnosis	500
<i>Alaa Sheta, Sara Elsir Ahmed, Walaa H. Elashmawi, Abdel Karim M. Baareh, Nastaran D. Pahnkholaee</i>	
Classification of Edible and Poisonous Mushrooms Using Lightweight Deep Learning Models on Mobile Devices	506
<i>Arif Sefa Bölükbaşı, Elif Eroğlu, Bora Tok, Enes Ayan</i>	
Plant Leaf Disease Classification Using a Multi-Scale Attention Network	512
<i>Fatimah Shamsulddin Abdulsattar, Nadia Shamsulddin Abdulsattar, Faiq Sabar Baji</i>	
The Impact of Artificial Intelligence and Digital Evolution on Employees’ Performance in the Public Sector: The Mediating Role of Organizational Communication	518
<i>Sahem Nawafleh, Heba Ibraeem Mahmoud Ahmad</i>	
Design of Experiments for Hyperparameter Optimization in VGG16-Based Acne Classification with Explainable AI	523
<i>Rob Christian Caduyac</i>	
AI-Driven Student Performance Prediction in Higher Education Using Multi-Source Educational Data	529
<i>Mohammad AlShaikh-Hasan, Alessandro Pandini, XiaoHui Liu, Gheorghita Ghinea</i>	
An AI-Driven Decision Support Framework for Change Order Management in Construction Projects: A Systematic Bibliometric Review	535
<i>Zaid Momani, Hanasha Ismail, Eeydzah Aminudin, Che Khairil Izam Che Ibrahim Siti Hamidah Abdull Rahman, Hamidah Mohd Saman</i>	
Prediction of Thyroid-Stimulating Hormone Control Status Using Interpretable Ensemble Learning	541
<i>Rowan AlEjjelat, Mahmoud E. Farfoura, Janthima Methaneethorn, Didi Rosiyadi</i>	
System 1, System 2: Fusing Asynchronous Vision-Language Guidance with Fast Continuous Embodied Agent Control	547
<i>Hussam Barham, Mohammad Fasha, Mohammad Al Khaldy</i>	
AI-Driven Framework for Adaptive Water Network Management with Proof-of-Concept Implementation: Addressing Non-Revenue Water in Jordan	552
<i>Mohammed Fasha, Nahel Al-Maayta, Bilal Sowan, Mohammad Athamneh, Husam Barham</i>	
Weighted Ensemble Learning for Defensive Intrusion Detection	558
<i>Mohammad Adnan Aladaileh, Abdullah Ahmed Bahashwan, Ahmed J. Hintaw</i>	
Cyber-Resilient Integrated Transport Systems: A Conceptual Framework for AI-Enabled Zero Trust Monitoring Informed by Amman’s BRT Transition	564
<i>Ali Al Maqousi, Andres Monzon, Amer Aljokhadar</i>	

Uncertainty-Aware Intrusion Detection via Bayesian Transformers with Causal Attack Graph Learning	569
<i>Mohammad Emad Arafah, Dena Abu Laila, Israa Abuzaid, Mohammad Ahmad</i>	
A Novel Deep Learning Framework with Feature Engineering for Stroke Risk Prediction	577
<i>Ahmad Al Athamneh, Mahmoud E. Farfoura, Abdel Fawaz Bagoudou, Saba Alshatali</i>	
BIM–AI Integration for Sustainable Urban Planning in Smart Cities: Framework, Challenges, and Future Trends	584
<i>Noorsan Abu Ja’far, Mohammad Alauthman, Amer Al-Jokhadar, Ali Al Maqusi</i>	
A Comparative Method for Evaluating Machine Learning Algorithms for Predicting Normalized Work Effort	590
<i>Kenza Meridji, Khalid T. Al-Sarayreh</i>	
Adopting artificial intelligence applications in legal education- studying the case of faculty of law at University of Petra	596
<i>Ali Mohamed Aldabbas, Mohammad Saeed Abdallah ALsheyab, Ma’en Abdel-Rahim Juwaihian</i>	
An Ultra-High-Resolution Detection Framework for Micro-Scale PCB Surface Defects	603
<i>Salam Al-E’Mari, Yousef Sanjalawe, Fadi Fataftah</i>	
Citizen-Centric Cyber Hygiene: A Resilient Framework for Public Security Awareness in AI-Driven Smart Urban Environments	609
<i>Ali Al Maqousi, Kashinath Basu</i>	
Enhancing Response Mechanisms Against LOLBAS Threats in SCADA Environments: Ablation Study and Practical Implications	617
<i>Thamer Abu-Alzanat, Jafar A. Alzubi, Ashraf AlDabbas, Hussam N. Fakhouri, Hasan Kanaker Omar A. Alzubi</i>	
MuZero-Based Autonomous Cyber Defense Agents for Software-Defined Networks (SDN)	623
<i>Mohammad Alauthman, Amjad Aldweesh, Ahmad Al-Qerem, Ammar Almomani, Basil Khalaf Mouhammd Alkasassbeh</i>	
BIM-Contextual Zero-Trust Digital Twins for IoT Security in Smart Buildings	630
<i>Mohammad Alauthman, Amjad Aldweesh, Ahmad Al-Qerem, Basil Khalaf, Ammar Almomani</i>	
Machine Learning Models for SQL Injection Detection: A Comparative Analysis and Hybrid Framework Proposal	637
<i>Mahmoud Baklizi, Mohammad Alkhazaleh, Loui Al Sardy</i>	
Data-Driven Modelling and Estimation of Global Cyberattack Impact Using Expanded Machine-Learning Analysis	643
<i>Mahmoud Baklizi, Mohammad Alkhazaleh, Loui Al Sardy</i>	
Secure QoS-Constrained Bandwidth–Power Allocation using Metaheuristic Optimizers	649
<i>Najem N. Sirhan, Tariq A. Khraishi, Hussam N. Fakhouri</i>	
Cost-Sensitive Machine Learning for Cloud Network Intrusion Detection	656
<i>Louay Karadsheh, Faten Hamad, Hussam Fakhouri</i>	
Binary Feature Selection in Cloud Intrusion Detection using Metaheuristics	662
<i>Louay Karadsheh, Faten Hamad, Hussam Fakhouri</i>	

SecureCloudOpt: Risk-Constrained Hybrid Metaheuristic Optimization for Security-Aware VM Placement with Co-Residency Mitigation	668
<i>Hasan Kanaker, Hussam N. Fakhouri, Muhannad Alkhalaileh</i>	
5G Base Station Assignment Optimization	674
<i>Najem N. Sirhan, Hussam N. Fakhouri, Muhannad Alkhalaileh</i>	
TGN-IDS: Detecting Lateral Movement with Temporal Graph Neural Networks	680
<i>Mohammad Emad Arafah, Dena Abu Laila, Israa Abuzaid, Ahmad Aladawi</i>	
Explainable Deep Learning for Intraocular Tumor Detection Using Ultra-Widefield Fundus Imaging	688
<i>Anas Khaleel, Mahmoud E. Farfoura, Yazan S Batarseh, Mohammad IA. Ahmad, Talal Salem Al-Qaisi</i>	
Two-Stage Brain Tumor Assessment from MRI Using Feature-Based Classification and U-Net Segmentation	694
<i>Mohammad Atallah Moh'd Al-Oudat, Enas Tawfiq Abusamra</i>	
A Business Intelligence Centered Framework for Early Warning and Prescriptive Recovery in Disrupted Supply Chains	700
<i>Maen Alzubi, Murad Bashabsheh, Zaidoun Al-Nweiran, Mutaz Abdel Wahed</i>	
Early Detection and Disease Stage Classification of Viral Hepatitis Using Machine Learning Algorithms	708
<i>Ala M. Abu-Samaha, Mohanad Zahedah</i>	
Integrating AI Technologies in Higher Education in the Arab Region: A Systematic Synthesis and Implementation Roadmap	713
<i>Mohammad A. Al-Shunnag, Ali Al Maqousi</i>	
Towards Seamless Data Portability and Migration in Multi-Cloud Environments: Addressing the Configuration Adaptation Gap	718
<i>Abrar Alzubaidi, Kenza Meridji, Khalid T. Al-Sarayreh</i>	
Chemist-Interpretable Explainable AI Through Semantic Knowledge Graphs: A Cross-Domain Framework for Molecular and Materials Property Prediction	726
<i>Ahmad Q. Daraosheh, Hussein Motlaq, Rahil Azhar, Wan Izhan Nawawi Wan Ismail</i>	
Fingerprinting MQTT and DDS Traffic at the Edge Using Behavioral Feature Engineering and Machine Learning	732
<i>Kamal Nassereddin, Mohammed Al-Hubaishi</i>	
Machine Vision-Based Classification of Rare Fruits in Bangladesh Using Transfer Learning and Custom CNN Models	738
<i>Md. Hasib Hasan, Afsana Islam, Rabeya Bosri, Mohammed Anwer, Md. Tarek Habib</i>	
Artificial Intelligence in Drug Discovery: From Target Identification to Generative Design and Clinical Translation	746
<i>Rami Abdel-Rahem, Elias Baydoun, Faisal Aburub, Faisal Al-Akayleh, Mayyas Al-Remawi Ahmed S.A. Ali Agha</i>	
Deep Learning for Multi-Omics Integration in Cancer: From Molecular Mechanisms to Clinical Translation	751
<i>Ahmed S.A. Ali Agha, Mayyas Al-Remawi, Faisal Al-Akayleh, Rami Abdel-Rahem, Faisal Aburub</i>	

AI-Driven Radiomics in Cancer: From Image-Derived Phenotypes to Clinically Actionable Tumor Intelligence	756
<i>Faisal Al-Akayleh, Ibrahim S.I. Al-Adham, Faisal Aburub, Rami Abdel-Rahem, Mayyas Al-Remawi Ahmed S.A. Ali Agha</i>	
AI-Driven Digital Twins in the Pharmaceutical Industry: Model-Informed Manufacturing, Quality, and Regulatory Decision-Making	762
<i>Mayyas Al-Remawi, Faisal Aburub, Rami Abdel-Rahem, Faisal Al-Akayleh, Ahmed S.A. Ali Agha</i>	
Artificial Intelligence for Microbiome Inference and Functional Prediction	767
<i>Mayyas Al-Remawi, Ibrahim S.I. Al-Adham, Rami Abdel-Rahem, Faisal Al-Akayleh, Faisal Aburub Ahmed S.A. Ali Agha</i>	
Self-Supervised Learning for Medical Imaging: From Representation Learning to Clinical Translation	772
<i>Faisal Aburub, Faisal Al-Akayleh, Mayyas Al-Remawi, Rami Abdel-Rahem, Ahmed S.A. Ali Agha</i>	
Comparative Analysis of CNN Models for Classifying Electrical Damage in Photovoltaic Panel Images	777
<i>Jamal Zraqou, Aseel Mousa, Murad Zeer</i>	
ZTF-SF: A Zero-Trust Blockchain-Enabled IIoT Framework for Secure Smart Factories	783
<i>Maruf Farhan, Madhuki Rajapakshe, Rejwan Bin Sulaiman, Mohammad Aljaidi, Usman Butt Mohammad Ahmad, Wael Hadi, Ahmad Abdullah Alshammari</i>	
Integrating Computational Intelligence for Automated Administration in Moodle Learning Environments	792
<i>Ahmad Shtayyat, Amjad Gawanmeh</i>	
Emotionally Adaptive Conversational AI for Personalized Learning	798
<i>Eman Alduweib, Essa Hezzam, Mohammed Noman</i>	
Risk-Aware Multi-Period Patch Scheduling Under Exploit Uncertainty via Hybrid Ant Colony Optimization	803
<i>Hasan Kanaker, Nurul Halimatul Asmak Ismail, Essam Alhroob, Hammoudeh Alamri</i>	
Ontology-Enriched Abstract Topic Modelling for Biomedical Trend Discovery: A MeSH-based LDA Framework with BI Visual Analytics	809
<i>Ahmad Altarawneh, Stephen Swift, Allan Tucker, Mahir Arzoky</i>	
Ontology-based Keyword Enriched Topic Modelling for Biomedical Research Trends: A Business Intelligence Perspective	817
<i>Ahmad Altarawneh, Allan Tucker, Stephen Swift, Mahir Arzoky</i>	
User-Centered Explainable AI Dashboard for Stock Price Forecasting	825
<i>Mohammad H. Abu-Arqoub, Rashiq Rafiq Marie, Ali A. Titinchi</i>	
Integrating Sustainability Competencies into Engineering Curricula: Jordan as a Case Study	832
<i>Nesreen Otoum, Gheorghita Ghinea, Ali Shehadeh, Rainer Herpers, Ahmed Mansour Mohammad A. Alzubaidi, Mwaffaq Otoom</i>	
From Campus Labs to Home Experimentation: Implementing Take-Home Laboratories in Engineering Education	840
<i>Nesreen Otoum, Enrique Arias, Mohammad A. Alzubaidi, Mwaffaq Otoom</i>	
Biosensing in the Internet of Medical Things: A System Architecture and Design-Oriented Survey	846
<i>Mwaffaq Otoom, Mohammad A. Alzubaidi, Gheorghita Ghinea, Shayma Al-Tahat, Nesreen Otoum</i>	

XAI-Enhanced Insider Risk Scoring with Adaptive Weighted Ensemble for Medium-Sized Organizations	853
<i>Mohammad H. Abu-Arqoub, Rashiq Rafiq Marie, Ali A. Titinchi</i>	
An Optimized Artificial Intelligence Framework for Accurate Network Intrusion Detection	860
<i>Alhamza Munther, Muhammad Rehan Faheem, Muhammad Waqas Nadeem, Mohammed Anbar</i>	
Automated Nursing Care Plan Creation Based on NANDA-I, NIC, and NOC Standards Using Pre-Trained Transformer Models	866
<i>Allen Bernard M. Tan, Herwayne John H. Cawili, Japeth A. Gomez, Salimar B. Tahir</i>	
Cross-Modal Robustness: Analyzing and Improving VQA Models Against Adversarial Textual Perturbations	873
<i>Nedal Nwasra, Ahmed Alsalemi</i>	
Multimodal Explainable AI (XAI) for Hateful Meme Classification: A Comprehensive Framework for Transparent Content Moderation	879
<i>Nedal Nwasra, Ali Alharthy</i>	
A Scalable Remote Laboratory Architecture for Inclusive Engineering Education: Multi-Institution Deployment Across Three Continents	886
<i>Nesreen Otoum, Enrique Arias, Dania Bani Hani, Mohammad A. Alzubaidi, Mwaffaq Otoom</i>	
Rethinking AI Ethics in Education: From Restrictive Policies to Learning-Oriented Design	894
<i>Suhailah Mohamed Noor, Zaid Momani</i>	
Machine Learning-Based Interference Prediction for Resource Allocation in NOMA-IBFD Cellular Systems	900
<i>Abdukhamid Mirzaakhmedov, Omer Waseem AL-Zaidi, Mohanad Alayed</i>	
The Invisible Hand of Artificial Intelligence: Polishing Diagnosis in Personalized Medicine – A Structured Review	906
<i>Eyad Mallah, Ahmad Altarawneh, Razan Bardees, Mahir Arzoky, Stephen Swift, Kenza Mansoor</i>	
Integrating Literature and Learning: A Graph Neural Network Framework for Herb-Drug Interaction Prediction Toward Sustainable and Clinically Informed Pharmaceutical Safety	914
<i>Eyad Mallah, Ahmad Altarawneh, Khaled Omari, Stephen Swift, Mahir Arzoky</i>	
Large-Scale Weather Data Integration for Solar Irradiance Forecasting Using Hybrid Deep Learning Models	919
<i>Zaid Momani, Abidalrahman Mohd, Shadi Shehadeh</i>	
A Scalable IoT–AI Framework for Real-Time Energy Anomaly Detection in Smart Grid Networks	925
<i>Mohammad H. Abu-Arqoub, Ali A. Titinchi, Rashiq Rafiq Marie</i>	
Federated Learning as a Governance-Aligned Intelligence Paradigm for Pharmaceutical Manufacturing and Research	931
<i>Faisal Aburub, Mayyas Al-Remawi, Rami Abdel-Rahem, Faisal Al-Akayleh, Ahmed S.A. Ali Agha</i>	
Predictive Maintenance and Fault Detection via Machine Learning in Pharmaceutical Manufacturing	937
<i>Faisal Al-Akayleh, Faisal Aburub, Mayyas Al-Remawi, Rami Abdel-Rahem, Ahmed S.A. Ali Agha</i>	
A Novel Framework for Real-Time Maldivian Script Recognition Using Convolutional and Recurrent Neural Networks	943
<i>Jamal Zraqou, Faisal Aburub, Jawad AlKhateeb</i>	

Real-Time Identity Verification for 6G Network Slicing Using Blockchain and Machine Learning	949
<i>Omer Waseem AL-Zaidi, Mohammed Al-Hubaishi</i>	
Machine Learning Dataset for Emotion Recognition from Neural Signals	955
<i>Faris Abuhashish, Mohammed Atoum, Isma H. Ismail</i>	
Hybrid MCTS++: An Adaptive Optimizer for Enhanced Game-Playing Performance	961
<i>Faris Abuhashish, Mohammed Atoum, Isma H. Ismail</i>	
Credit Card Fraud Detection using Supervised and Ensemble Methods	966
<i>Mohammad Adnan Aladaileh, Ahmed J. Hintaw, Faten Hamad, Ashraf Dabbas</i>	
Household Vulnerability Clustering Analysis Using K-Means Algorithm	973
<i>Yousra Harb, Mohammad Rashdan, Zaid Alkhear Aburumman, Mohamed Abuseini</i>	
Short-Term Electrical Load Forecasting with Multidimensional Feature Extraction: A Machine Learning Approach	979
<i>Meirah Khaleifa Khameis Ali Alkaabi, Mohammed Al-Betar, Yang Xiao, Hai Tao</i>	
Comparative Study of Imprint Extraction Methods with Vision Transformer–Based Feature Fusion for Pill Image Recognition	985
<i>Linh Nguyen Thi My, Tham Vo, Vinh Truong Hoang</i>	
LIME-Based Analysis of Adversarial Feature Manipulation in Cloud Intrusion Detection Systems	993
<i>Humberto Goncalves, Zakaria Alomari</i>	
EfficientNetB2-Based Deep Learning for Fine-Grained Jewelry Image Classification with State-of-the-Art Accuracy	1000
<i>Md. Masum Billa, Jannatul Ferdous Nishi, Moaz Moaz, Subrata Kumar Dey, Md. Tarek Habib</i>	
Improving Lightweight Convolutional Neural Networks Performance for Colorectal Cancer Diagnosis via Knowledge Distillation	1007
<i>Sümeyye Karatekin, Enes Ayan</i>	
Optimizing Retrieval-Augmented Generation for Querying Locally Stored Public Procurement Documents using Small Language Models	1013
<i>Dean Reight F. Billedo, Al-Sтивен John P. Tumimbang, Anthony Marc T. Huesca, Jaydee C. Ballaho</i>	
A Deep Learning Approach to Improving Multilingual Neural Machine Translation using Semantic and Linguistic Features	1019
<i>Yaxi Su, Mohamad Yusof Darus, Norizan Mat Diah, Yuxia Du, Ling Li, Yang Xiao</i>	
Graph Attention Networks Enhance Fine-Grained Academic Performance Prediction in MOOCs by Modelling Structural Relationships	1025
<i>Huang Shiqin, Zhou Jiaying, Xiao Hongyun, Hai Tao, Yang Xiao</i>	
Privacy-Preserving Federated IoT Anomaly Detection with Energy-Aware Training and Threshold Calibration	1031
<i>Arda Arancioğlu, Mohammed Al-Hubaishi</i>	
SecEdgeOpt: Risk-Aware Joint Optimization of Secure Task Offloading and Intrusion-Detection Placement in Multi-Access Edge Computing	1037
<i>Hasan Kanaker, Faten Hamad, Hazem Abu-Adaiq</i>	

Constraint-Aware Hybrid Metaheuristic Optimization for Joint IDS Placement and Key-Refresh Scheduling in Resource-Constrained IoT Edge Networks	1043
<i>Hasan Kanaker, Samer A. B. Awwad</i>	
A Security-Aware Graph-Based Learning Framework for Joint Task Scheduling and Resource Allocation in Cloud Computing	1049
<i>Salam Al-E'Mari, Yousef Sanjalawe, Fadi Fataftah</i>	
Long-Term IEEE 802.15.4 Propagation Modeling in Millet Fields Using Machine Learning	1055
<i>Mohammed Salem, Mohammed Al-Hubaishi</i>	
AI-Driven Optimization of the Cybersecurity Incident Response Lifecycle: A Review and Framework Based on NIST SP 800-61	1063
<i>Sokroern Ang, Rejwan Bin Sulaiman, Sopheaktra Huy, Mohammad Aljaidi, Mony Ho Midhunchakkaravarthy Janarthanam, Wael Hadi, Ahmad Abdullah Alshammari</i>	
A Comparative Study for Optimizing Phishing Detection Using Machine Learning Algorithms	1069
<i>Muntarin Islam, Rejwan Bin Sulaiman, Maruf Farhan, Mohammad Aljaidi, Md Amin Azad, Kazi Ejajul Sheikh Atiqul Haque Saber, Wael Hadi</i>	
Bridge Structural Health Monitoring Using Vision Transformers and Graph Neural Networks	1077
<i>Qasim Aljamal, Mahmoud Aljamal, Mohammad Aljaidi, Ayoub Alsarhan, Maruf Farhan, Wael Hadi Hayel Khafajeh, Ahmad Abdullah Alshammari</i>	
Generative AI for Structural Design of Earthquake-Resistant Civil-Mechanical Systems	1085
<i>Qasim Aljamal, Mohammad Q. Al-Jamal, Jamal Al Sadi, Mohammad Aljaidi, Mahmoud Al-Jamal Ayoub Alsarhan, Maruf Farhan, Wael Hadi, Ahmad Abdullah Alshammari</i>	
The Impact of Instructor Digital Competence on Student Engagement in Online Learning: Evidence from a Questionnaire-Based Study	1093
<i>Faisal Aburub, Rami Abdel-Rahem, Mayyas Al-Remawi</i>	
Impact of Interactive Digital Learning on Student Engagement	1099
<i>Faisal Aburub, Rami A. Abdel-Rahem, Mayyas Al-Remawi</i>	
AI as a Supportive Tool in Education: Perceptions and Attitudes of Academic Staff	1104
<i>Faisal Aburub, Rami A. Abdel-Rahem, Mohammad Emad Arafah, Mayyas Al-Remawi</i>	
An AI Agent Using NLP for Automating Documentation and Formal Specification Generation in the Software Development Life Cycle	1109
<i>Saif Okour, Mahmoud AlJamal, Mohammad Aljaidi, Bashar Khassawneh, Wael Hadi, Ayoub Alsarhan Rejwan Bin Sulaiman</i>	
Cross-Realm Embodied Interactions: Bridging Physical and Virtual Social Presence Through Digital Twin Environments	1117
<i>Khalil Omar, Jorge Marx Gómez</i>	
The Future Patterns of Intelligent User Interfaces: A Comprehensive Framework for Adaptive, Context-Aware, and Multimodal Interaction Systems	1124
<i>Khalil Omar, Jorge Marx Gómez</i>	
Sovereign AI Defense: Bilingual LLM-Driven Phishing Detection for Low-Resource Languages	1131
<i>Mohammad Alauthman, Amjad Aldweesh, Ahmad Al-Qerem, Basil Khalaf, Mouhammd Alkasassbeh</i>	

Enhanced Multi-Scale Deep Learning Framework for Dynamic Scene Deblurring	1138
<i>Jamal Zraqou, Sokyna Alqatawnah, Firas Omar, Ayman Alnsour</i>	
A Novel Quantum-Resilient Proxy Re-encryption for UAV-to-Cloud Communication	1146
<i>Mahmoud Aljamal, Mohammad Aljaidi, Saif Okour, Ayoub Alsarhan, Rejwan Bin Sulaiman, Wael Hadi Ahmad Abdullah Alshammari</i>	
A Blockchain and IoT-Based Framework for Transparent and Traceable Smart Agriculture: AlgroTech	1154
<i>Lamis Zaaboub, Soundes Belaib, Sarra Cherbal, Ashraf Mashaleh, Amjad Gawanmeh</i>	
EV-ProveBox: A Dynamic, Renewable, and Provenance-Aware S-Box Framework for Secure Healthcare IoT Encryption	1161
<i>Rahma Berchi, Lemia Louail, Sarra Cherbal, Ashraf Mashaleh, Amjad Gawanmeh</i>	
Artificial Intelligence-Driven Prediction of Mechanical and Durability Properties of Hemp-Fiber-Reinforced Concrete	1167
<i>Mohammad Q. Al-Jamal, Qasim Aljamal, Jamal Al Sadi, Mohammad Aljaidi, Mahmoud Al-Jamal Wael Hadi, Maruf Farhan, Ayoub Alsarhan, Ahmad Abdullah Alshammari</i>	
A Novel Dynamic Hyperparameters tuning of optimized Basic ML Classifiers to effective DDoS Attack detection	1175
<i>Zaid Jawasreh, Safwan Shatat, Rand Alsaleh, Mohammad Aljaidi, Mahmoud Aljamal, Wael Hadi Rejwan Bin Sulaiman, Ayoub Alsarhan, Ahmad Abdullah Alshammari</i>	
Dynamic Defense Architectures: Self-Optimizing Neural Networks for IoT Attack Mitigation	1182
<i>Mohammad Aljaidi, Mahmoud Aljamal, Wael Hadi, Ayoub Alsarhan, Zaid Jawasreh, Rejwan Bin Sulaiman Ahmad Abdullah Alshammari</i>	
Determinants of Student Engagement in E-Learning: Evidence from Blended and Fully Online Courses	1190
<i>Faisal Aburub, Rami A. Abdel-Rahem, Mayyas Al-Remawi</i>	
Exam Preparation in the Age of AI: Investigating University Students' Use of Artificial Intelligence Tools	1196
<i>Saif AbuAisheh, Liyana Shuib, Hiba Alsharqawi, Nadin Qoqas, Liyan Altahrawi</i>	
Adversarial Machine Learning in Real-Time Threat Detection A Multi-Agent Defense Framework Against Adaptive Cyber Attacks	1200
<i>Khalil Omar, Jorge Marx Gómez</i>	
A Conceptual Model for Integrating AI and Metaverse in Education	1205
<i>Khalil Omar, Jorge Marx Gómez</i>	
Affective-Aware Learning Systems: Bridging Emotion and Education through AI	1213
<i>Khalil Omar, Jorge Marx Gómez</i>	
Adaptive Hybrid AI Model for Personalized Learning Ecosystems in the Metaverse	1221
<i>Khalil Omar, Jorge Marx Gómez</i>	
From Static Surveys to Adaptive Questionnaires: A Systematic Review of Generative AI-Driven Personalization in Education	1229
<i>Saif AbuAisheh, Ying Wah Teh, Liyana Shuib</i>	
Extreme Learning Machine Software Defect Prediction Hybrid Model	1235
<i>Ala M. Abu-Samaha, Islam Akram Twaiqat</i>	

Synthetic Brain Tumour Classification: A Complete Experiment	1241
<i>Faris Abuhashish, Mohammed Atoum, Isma H. Ismail</i>	
High-Resolution 3D Dense-U-Net Architecture for Fully Automatic Volumetric Segmentation of Brain MRI and Spine CT Images	1246
<i>Faris Abuhashish, Hamzah A. Alkhazaleh, Anas W. Arram</i>	
Attention-Enhanced Convolutional Neural Network for Real-Time Facial Expression Recognition and Tracking	1254
<i>Jamal Zraqou, Mutaz Abu Sara, Adnan Al-Helali, Jawad Hasan AlKhateeb</i>	
A Hybrid CNN-LSTM Framework for Energy Consumption Forecasting: Methodology and Preliminary Analysis	1261
<i>Nedal Nwasra, Zahid Hussain Qaisar</i>	
AI-Driven Security Framework for Adaptive Cyber Defense: An Experimental Study using CICIDS2017 Dataset	1268
<i>Nedal Nwasra, Nawaf Ali</i>	
Multi-Frame Super-Resolution Image Reconstruction from Multiple Low-Resolution Images Using Enhanced Iterative Back Projection Algorithm	1273
<i>Jamal Zraqou, Sokyna Alqatawnah</i>	
Social Aspects of Artificial Intelligence in Education: Perceptions of Academic Staff at the University of Petra	1279
<i>Faisal Aburub, Rami A. Abdel-Rahem, Mohammad Emad Arafah, Mayyas Al-Remawi</i>	
Digital Transformation and Operational Performance in Jordanian Commercial Banks	1285
<i>Faisal Aburub, Mai Mohammad Jaber, Saad Zighan</i>	
Enhancing LMS Privacy and Performance through Computational Intelligence for Secure and Efficient Moodle Administration	1291
<i>Ahmad Shtayyat, Amjad Gawanmeh</i>	
Enhanced Moodle Analytics for Learning Management Optimization using Computational Intelligence	1297
<i>Ahmad Shtayyat, Amjad Gawanmeh</i>	