Editorial

Lorna Uden*

School of Computing,
Faculty of Computing and Digital Technologies,
Mellor Building, University of Staffordshire College Road,
Stoke-on-Trent, ST4 2DE, UK
Email: L.uden@staffs.ac.uk
*Corresponding author

Iraklis Varlamis

Department of Informatics and Telematics,
Harokopio University of Athens,
9, Omirou Street, 177 78, Tavros, Athens, Greece
Email: varlamis@hua.gr

Biographical notes: Lorna Uden is a Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at Staffordshire University. Her research interests include artificial intelligence, technology learning, HCI, activity theory, big data, user experience, knowledge management, web engineering, multimedia, e-business, service science and innovation, mobile computing, cloud computing, neuroscience, social media, intelligent transport systems, healthcare, internet of things and problem-based learning.

Iraklis Varlamis is a Professor of Data Management in the Department of Informatics and Telematics at Harokopio University of Athens, Greece. He holds a PhD from Athens University of Economics and Business, Greece, and an MSc in Information Systems Engineering from UMIST UK. His research interests vary from data mining and the use of semantics in web mining to social network analytics and knowledge extraction from social media and the news. He collaborates with several start-ups, companies, and government bodies as a technology mentor. He is the scientific coordinator in several H2020 and Erasmus+ projects.

Welcome to V20 N1 issue of *IJWET*. This issue consists of five papers, each tackling diverse and innovative applications of advanced technologies. These studies span from enhancing blockchain-based solutions for rural e-commerce traceability to advancing cross-chain data exchange security, while also contributing to the evaluation of student innovation in higher education and optimising cloud storage frameworks for data retrieval. Additionally, the issue explores the integration of deep learning and collaborative filtering algorithms in interior design systems to improve personalisation and recommendation accuracy.

The first article, authored by Jingjing Yang and titled 'Development strategy of rural e-commerce in the context of new media: construction of traceability system based on improved DPoS algorithm', examines the challenges of cold chain traceability in rural

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e-commerce and proposes an enhanced blockchain-based solution. Recognising the critical role of food safety and supply chain transparency in rural e-commerce, the author introduces a novel traceability system that integrates an improved delegated proof of stake (DPoS) consensus mechanism with the Merkle Patricia tree. By incorporating the witness committee model and Shapley value, the proposed system efficiently selects block nodes and allocates node values, thereby improving security and eliminating malicious nodes. The study demonstrates that after applying this system, complaints and negative reviews from rural e-commerce enterprises decreased significantly, underscoring its effectiveness in enhancing product traceability. Through rigorous analysis and comparative evaluations, this research highlights the impact of blockchain technology in strengthening the authenticity and integrity of traceability data, ultimately promoting rural economic development and reinforcing consumer trust in e-commerce platforms.

The second article, authored by Qiong Li and Lei Wang, titled 'Cross-chain data exchange and information security protection management in blockchain', explores the critical challenge of ensuring security and privacy in cross-chain data exchange. The study introduces a data exchange and security management protocol that leverages a cross-chain channel matching (CCM) model, incorporating communication protocols between relay chains and licensed blockchains. To enhance security, a pre-adapter signature algorithm protocol is designed, integrating anchor-relay chain (ARC) and licensed inter-blockchain connection communication protocols (LIBCCP). Experimental results validate the efficiency of the proposed approach, demonstrating a 9.08% reduction in average exchange time and achieving a 79% data protection effect. Additionally, the peer-matched consensus mechanism offers advantages in energy efficiency, decentralisation, and scalability. This research significantly contributes to cross-chain security by reinforcing data protection, ensuring trusted interoperability between IoT blockchains, and mitigating the limitations of single-chain information silos.

The third article, 'Evaluation of students' innovation and entrepreneurship based on genetic neural network algorithm under sustainable development in higher education institutions', by Xuanyuan Wu, Yi Xiao and Anhua Liu, presents a novel approach to assessing students' innovation and entrepreneurship abilities in higher education institutions (HEIs). The study aims to enhance evaluation accuracy and objectivity by integrating the analytic hierarchy process (AHP) with the entropy value method (EVM) to determine the weight of key evaluation indicators. A genetic algorithm-backpropagation neural network (GA-BP) is introduced to optimise the evaluation model, improving learning speed and reducing overfitting. Experimental results confirm the superiority of GA-BP over traditional methods such as BPNN, random forest, and decision trees, exhibiting lower mean square error and higher accuracy. This research contributes to the field of educational assessment by providing a scientific and systematic evaluation framework, aiding HEIs in fostering students' innovation and entrepreneurship competencies, and supporting sustainable development in higher education.

The fourth article, 'Cloud storage framework for multivariate regression-based data mining: optimised LIFR and FIFR model', by Saswati Sarkar and Anirban Kundu, introduces a cloud-based storage framework designed to enhance data retrieval efficiency. The framework incorporates optimised mapping techniques for searching data using multivariate regression-based data mining. Key innovations include the use of map tables, storage partitions, and a parallel disk searching technique that minimises time

consumption. The authors propose last in first read (LIFR) and first in first read (FIFR) searching techniques, showing how they can be optimised to achieve linear time complexity. Experimental results indicate that the execution time decreases with an increase in the number of drive partitions. A comprehensive comparison of the proposed method with existing techniques is provided, using time complexity and execution time graphs to demonstrate the effectiveness of the approach. The paper offers valuable insights into optimising cloud storage frameworks, particularly for high-performance, scalable data retrieval.

The fifth article, 'Intelligent interior design based on deep learning and CF algorithm' by Yuan Ren, explores the integration of deep learning (DL) and collaborative filtering (CF) algorithms in creating personalised, efficient interior design recommendation systems. Addressing the issues of low personalisation and accuracy in traditional home matching and style recommendation systems, the paper introduces an optimised CF algorithm combined with content-based methods and principal component analysis (PCA). This improved algorithm significantly enhances recommendation accuracy. Furthermore, a neural CF style recommendation model utilising channel attention is developed, leveraging convolutional neural networks (CNNs) and generalised matrix decomposition. Experimental results demonstrate high accuracy rates in home matching and style recommendations, with hit rates of up to 92.14% in bedroom matching schemes. The proposed model offers substantial improvements in recommendation precision and provides a promising direction for the future of interior design systems, emphasising personalisation and effective user interaction.