Editorial

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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 N2 issue of *IJWET*. This issue has five papers each tackling diverse and innovative applications of advanced technologies. The studies span from developing resource-efficient frameworks for digital education and optimising task offloading in edge computing to enhancing authentication methods for modern multimedia devices and integrating digital twin and SLAM technologies for intelligent campus management. Additionally, the issue examines novel machine learning approaches for image sentiment analysis, offering fresh insights into the fusion of human visual perception with computational techniques.

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The first article, titled 'Digital education mining technology based on composite collaborative filtering and Eclat algorithm' by Jingya Wang, Qi Han, Kunkun Ma and Li Xu tackles the challenge of optimising educational resource recommendations in digital learning environments. The authors propose a hybrid model combining item-based (IBCF) and user-based collaborative filtering (UBCF) with the Eclat algorithm to address inefficiencies in traditional methods. By leveraging Eclat's vertical data formatting, the system reduces computational costs compared to Apriori, while achieving almost perfect recommendation accuracy. Innovations like mean-square model vectorisation and label spreading networks further enhance scalability and personalisation. Rigorous testing on MovieLens and Amazon datasets confirms superior performance in convergence and real-world applicability, with expert evaluations praising its educational value and technical feasibility. This research bridges critical gaps in digital education, offering a robust framework for data-driven, resource-efficient learning platforms.

The second article, titled 'Combined jelly-snake optimisation with deep learning architecture for task offloading and resource allocation in edge computing', by A. Raja, P.M. Prathibhavani and K. Rajuk Venugopal presents an innovative solution to the growing demands of efficient task offloading and resource management in edge computing environments. Addressing key challenges such as latency, limited computational resources, and dynamic workloads – particularly in medical applications – the authors propose a hybrid deep learning and optimisation framework. A convolutional neural network (CNN) is employed to decide task offloading based on system conditions, while a novel SUJO algorithm, combining jellyfish search optimisation and snake optimiser, ensures optimal resource allocation by considering execution time, energy consumption, and task priority. The framework integrates wireless body area networks (WBAN), gateway user nodes (GUNs), and edge servers (ESs), reducing the load on medical centres and improving responsiveness in healthcare scenarios. Simulation results show that the SUJO model significantly reduces energy consumption compared to existing methods, highlighting its potential to enhance the performance and efficiency of edge computing infrastructures.

The third article, authored by Zitian Liao and Xiaoqun Liao, is titled 'Authentication of musical speech devices based on RF fingerprint recognition'. This study addresses the growing concerns of security and privacy in musical voice devices – such as smart speakers, headphones, and voice assistants – which have become increasingly pervasive in daily life. The authors propose an innovative authentication method based on radio frequency fingerprint identification (RFFI), aiming to offer a secure, efficient, and user-friendly alternative to traditional methods like passwords or voiceprint recognition. The paper introduces a feature fusion technique that combines both time-domain and frequency-domain characteristics of RF signals. By integrating two novel algorithms – HITD-Corr for the time domain and BFEA for the frequency domain – the approach enhances the accuracy, reliability, and resilience of device authentication. Experimental validations demonstrate that the feature fusion technique significantly outperforms conventional methods, including deep learning and neural networks, particularly in terms of recognition performance, operational efficiency, and resistance to interference. Moreover, the study underscores the positive impact of this method on user experience, highlighting its practicality for real-world applications. This work makes a valuable contribution to the advancement of RF fingerprint recognition technologies and presents a compelling solution to the pressing issue of secure authentication in next-generation musical voice devices.

The fourth article, authored by Weihua Feng and titled 'Smart campus integration system based on SLAM and digital twin drive technology', addresses the persistent challenges of information silos, inefficient resource utilisation, and limited real-time responsiveness in university digital infrastructure. To overcome these issues, the author proposes a smart campus integration platform that combines structured data modelling with cutting-edge technologies such as digital twinning, big data, and simultaneous localisation and mapping (SLAM). The system enables the virtual-real fusion of campus data, offering real-time visualisation and interactive 3D monitoring capabilities. Through the application of oblique imagery and 3D modelling techniques, the proposed platform enhances route planning, space utilisation, and service delivery across campus environments. Experimental validation demonstrates improvements in data processing efficiency, user satisfaction, and emergency responsiveness, positioning the system as a robust, scalable, and intelligent foundation for future campus development. This work highlights the transformative potential of integrating SLAM and digital twin technologies in advancing intelligent campus ecosystems.

The fifth article, authored by Yongsong Liu and titled 'Fusion of visual attention model and SVM for sentiment analysis of planar images', explores the challenge of accurately recognising emotions expressed in images – a task that traditional classifiers often struggle with. Drawing inspiration from the way the human visual system processes imagery, the study introduces a sentiment analysis approach that combines a visual attention model with support vector machines (SVM). This method enhances emotional feature extraction by focusing on visually significant areas of images and fusing multiple visual attributes, such as colour, texture, shape, and cognitive features. The results demonstrate that as more features are integrated, sentiment recognition improves, reaching a classification accuracy of 72.9%. By simulating human attention patterns, the proposed model offers a more precise understanding of emotional cues in planar images, making it a valuable tool for applications ranging from social media analysis to visual design. The study underscores the growing role of computer vision and machine learning in decoding affective content and suggests future directions involving multimodal sentiment analysis.