Editorial

Lorna Uden*

School of Computing,
Faculty of Computing and Digital Technologies,
Staffordshire University,
Mellor Building, 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,
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 technology learning, HCI, activity theory, big data, knowledge management, web engineering, multimedia, artificial intelligence, e-business, service science and innovation, mobile computing, cloud computing, neuroscience, social media, intelligent transport systems, internet of things and problem-based learning.

Iraklis Varlamis is a Professor in 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 is collaborating with several start-ups, companies, and government bodies as a technology mentor. He is a scientific coordinator in several H2020 and Erasmus+ projects.

Welcome to V19N1 issue of *IJWET*. This issue consists of five papers.

The first article 'Application of improved K-means algorithm in the cultivation of creative music talents under the needs of sustainable development and transformation' authored by Peng Li and Zeng Fan, turns into the pressing challenges in higher education, particularly in the detection of talented students in the realm of creative music, based on their performance in courses. The paper introduces a new clustering method, called DAE-K, which combines the merits of denoising auto encoders in dimensionality reduction with the K-means clustering algorithm. The method is applied on a dataset comprising the performance scores of 500 juniors from a music college in China in music theory and practical operation courses. The resulting clustering scheme reveals three main groups of students and indicates that students with good theoretical level, have a

reduced innovation ability thus indicating that their practical training needs to be strengthened. The article not only contributes to the literature on clustering algorithms and teaching methodologies but also offers a promising model for data-driven analysis and classification in the education sector, aligning with the broader goals of sustainable development in the new era.

The second article, titled 'Deep learning-based task scheduling in edge computing', authored by Bantupalli Nagalakshmi and Sumathy Subramanian, explores the intricate challenges in task scheduling within the domain of edge computing (EC) through the lens of deep learning methodologies. The research addresses the critical need for efficient resource allocation in internet of things (IoT) applications at the network edge and introduces a novel approach to task scheduling, leveraging a hybrid optimisation technique named hybrid bald eagle Archimedes optimisation (HBEAO) and a deep convolutional neural network (DCNN) for risk probability estimation. The IoT-EC scenario serves as the backdrop for the investigation, with a focus on maximising long-term task satisfaction by considering parameters like makespan, execution time, execution cost, and risk probability. The article contextualises the emergence of the EC paradigm, emphasising its role in reducing task reaction time, enhancing energy efficiency, and fortifying security and privacy. It also highlights the proximity of edge servers to IoT devices as a means to expedite task responses, countering the latency associated with centralised cloud computing (CC). The importance of effective task scheduling algorithms in optimising user experience and resource efficiency is underscored, with a critique of traditional FIFO-based approaches. The article not only contributes to the literature on EC but also offers a comprehensive evaluation of the proposed model, showcasing its prowess in minimising execution cost, time, and risk probability.

The third article, titled 'PR-MQTT: a novel approach for traffic reduction and message prioritisation in IoT applications', is authored by Jiby J. Puthiyidam and Shelbi Joseph, and introduces the innovative PR-MQTT approach for prioritising important message transmission. Acknowledging the challenges posed by limited resources in IoT devices and the consequent need for efficient data management, the authors present a solution that selectively transmits messages while prioritising urgent ones, thus reducing network traffic. The method, seamlessly integrated with the HBMQTT message broker, is demonstrated through experimental evaluation, showcasing its ability to maintain consistent latency for priority messages, resulting in a remarkable speed improvement of over 90% compared to regular messages. The article not only contributes to addressing the crucial issue of efficient data management in IoT but also presents a tangible solution with real-world applicability, highlighting the contributions in advancing the field of IoT communication protocols.

In the fourth article titled 'A distributed framework for distributed denial-of-service attack detection in internet of things environments using deep learning', Wawire Amisi Silas, Lawrence Nderu and Dalton Ndirangu address the vulnerability of internet of things (IoT) networks to distributed denial-of-service (DDoS) attacks. They recognise the unique challenges posed by the heterogeneity and limited resources of IoT environments and propose a robust DDoS detection framework based on the CNN-BiLSTM model. The framework, designed for deployment in distributed networks, undergoes simulations demonstrating its application and effectiveness. The article aims to contribute significantly to IoT security practices by leveraging deep learning techniques to enhance the identification of DDoS attacks in real-time, ultimately supporting the

sustainable growth and adoption of IoT technologies across diverse industries and sectors. The research objectives encompass designing and implementing the distributed DDoS detection framework and evaluating its performance using relevant metrics and real-world datasets, highlighting the potential impact on enhancing IoT network security.

The fifth paper, 'Performance evaluation of higher education management under the background of knowledge management' by Xun Mo, presents a method for reducing the indicators needed by an education management performance evaluation index. The method combines rough sets and PCA to find the representative four factors that affect the index, based on the original set of 21 factors. The resulting set of indicators is fed to a classic back-propagation neural network, the hyperparameters of which are optimised using the improved whale optimisation algorithm. This unique combination of optimisation methods, neural networks, and feature selection achieves better performance than other optimiser-classifier combinations. The resulting college education management performance prediction model has been proven effective and accurate and can be used for the continuous improvement of college education management, using a limited number of key factors to make its predictions.