Editorial

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Biographical notes: Lorna Uden is Professor Emeritus of IT Systems in the Faculty of Computing, Engineering and Technology at the 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 of Data Management in the Department of Informatics and Telematics at the 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 V19N3 issue of *IJWET*. This issue consists of five papers.

The first article, authored by Zhijun Chen and Shuang Guo, titled 'Combination of Lv-3DCNN algorithm in random noise environment and its application in aerobic gymnastics action recognition', addresses the challenges of action recognition in aerobic gymnastics, particularly the limitations of traditional methods in accurately capturing time and spatial features. This study introduces a novel visualised three-dimensional convolutional neural network (3DCNN) algorithm that incorporates unsupervised visualisation techniques and a random noise perturbation enhancement algorithm to improve recognition accuracy. The results demonstrate that the enhanced algorithm significantly reduces mean square error, indicating a higher level of precision in recognising aerobic movements compared to conventional methods. The integration of noise perturbation and visual analysis not only enhances the model's ability to process

complex movement data but also outperforms existing algorithms in recognising subtle actions, making a substantial contribution to the field of human action recognition in educational and research contexts.

The second article, authored by Anastasia Analyti, titled 'Why provenance of SPARQL 1.1 queries', explores the critical concept of source why provenance in the context of extended SPARQL queries, which expand upon the SPARQL 1.1 standard to support multiple datasets and more complex query patterns. The study introduces algorithms designed to identify the minimal sets of RDF graphs contributing to the derivation of specific answer mappings, enhancing the understanding of data provenance and its implications for information quality, reliability, and accountability. This work is particularly significant for monotonic queries, where the derived provenance sets offer insights into the minimal sources needed to reproduce an answer. However, the study also reveals that this property does not hold for non-monotonic queries, adding complexity to provenance tracking. By providing a framework to trace the origins of data used in SPARQL queries, this research contributes to the broader field of semantic web technologies, offering tools that improve confidence in query results and facilitate better decision-making based on RDF data.

The third article by G.R. Vineetha and Shiyas Chekkot Rasheedali, titled 'Revolutionising facility layout: a case study of dynamic facility layout in cable production', introduces a novel approach to tackling the dynamic facility layout problem (DFLP) by breaking it into smaller, more manageable quadratic assignment problems (QAPs) for each planning period. The study employs a machine learning-based genetic algorithm (ML-GA) enhanced with pairwise exchange local search (PWX-LS) to optimise plant layouts, demonstrating superior performance on benchmark problems compared to existing methods. The research also includes a case study of a cable production company in Kerala, suggesting that transitioning from a static to a dynamic layout could yield significant cost savings and improved efficiency.

The fourth article by Xue Jiang, titled 'Identification of badminton players' swinging movements based on improved dense trajectory algorithm', presents an innovative approach to improving the recognition accuracy of badminton players' swing movements through an improved dense trajectory algorithm (IDTA). The study addresses the challenges posed by the rapid and diverse nature of badminton swings, proposing an optimised feature extraction method using an enhanced SURF algorithm for better performance. By employing dense sampling, trajectory tracking, and advanced feature fusion, the IDTA achieves high recognition accuracy on several benchmark datasets, significantly outperforming traditional methods. This research provides valuable insights and tools for technical analysis, training, and competition evaluation in badminton.

The last article, by Abhijeet Ramesh Raipurkar, titled 'Synoptic crow search with recurrent transformer network for DDoS attack detection in IoT-based smart homes', introduces an innovative approach to detecting distributed denial-of-service (DDoS) attacks in smart homes, a critical security challenge in the IoT landscape. Traditional methods struggle with the nonlinear behaviour of network traffic and the complexities introduced by encrypted data. To address these issues, the study proposes a synoptic weighted crow search algorithm (SWCSA) to effectively capture dynamic traffic patterns and an adaptive recurrent transformer neural network (ARTNN) to detect DDoS attacks, even within encrypted data. The results demonstrate the model's high detection accuracy, low false alarm rate, and effective mitigation of DDoS attacks, offering significant advancements in smart home security.