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## Preface

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**Biographical notes:** Zahoor Khan (PhD, SMIEEE) is a Division Chair of Computer Information Science (CIS) and Applied Communication divisions at Higher Colleges of Technology, UAE. He received his PhD from Dalhousie University, Canada. His research interests include but are not limited to the areas of theoretical and practical applications of wireless sensor networks, smart grids and the internet of things. His research outcomes include several journal papers, book chapters, and numerous conference proceedings, all peer-reviewed. The journal papers have appeared in prestigious and leading journals. Several conference papers have won the best paper awards. He is an editor of several journals.

Nasser Nassiri is the Associate Executive Dean of the Computer Information Science Division at the Higher Colleges of Technology (HCT). He holds a PhD in Human-Computer Interaction from Leeds Beckett University in the UK. His research interests are e-commerce and trust, human computer applications, interaction design, and collaborative virtual environment. He has published several papers in internationally and locally recognised conferences and peer-reviewed journals with high impact factors.

Amala Rajan received her PhD in formal semantics for distributed programming from the School of Science and Technology, Middlesex University, London, UK, in 2009. She has worked in various international universities in India, Malaysia, UK, UAE, etc. Presently she is the program coordinator and assistant professor of the CIS Department, Higher Colleges of Technology, Dubai Women's College. Her expertise is in operational and axiomatic semantics, distributed programming, ERP systems, and emerging technologies. She has carried out many funded research projects in India and Malaysia, and actively presented and published refereed conference papers and journal articles.

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We would like to present, with great pleasure, this special issue of the *International Journal of Grid and Utility Computing (IJGUC)* with selected papers from the Information Technology Trends (ITT-2017) conference, UAE. The volume includes six papers related to the theme of ITT 2017, which is Innovative Technologies for Smart Learning, and research results of other latest technological advancements.

The first paper, titled 'Educational data modelling using curve fitting and average uniform algorithm', proposes a curve fitting quadratic function that is used to model educational data. The resultant model was proven to be used to predict one or more output variables based on different values for input variables. The average uniform algorithm (AUA) is a metaheuristic optimisation that can be used to optimise a wide variety of continuous functions (linear,

nonlinear, convex and non-convex). The AUA algorithm is used to find the optimal values for the coefficients of the quadratic function. Moreover, the optimal values for these coefficients are found using the classical derivative method for the sake of comparison.

The second paper, titled 'Energy harvesting techniques for routing issues in wireless sensor networks', discusses some recent routing protocols in the field of EH-WSNs and presents a comparative analysis in accordance with their categories in which they lie. A detailed analysis of their key advantages and flaws is also identified in this research. The paper addresses different advantages and flaws of the routing protocols that were introduced recently for energy harvesting in WSNs.

The paper titled 'Evaluating the affordances of wearable technology in education' surveys the recently published

wearable technology information and experiments in education and its consumer acceptance factors according to the Technology Acceptance Model (TAM). Alongside the advantages of this technology in the education field, the paper demonstrates the limitations and negative after-effects accompanying its applications, to judge the effectiveness of its employment in developing students' learning and success. The paper reveals that there are a considerable number of restrictions limiting the wider application of this technology in the education sector, which educators should analyse and propose solutions for before suggesting further involvement of wearable devices in learning and teaching.

The aim of the research work titled 'High-speed gesture modelling through boundary analysis of active signals from wearable data glove' is to find a more reasonable feature extraction technique to make it convenient for the classification algorithm to differentiate gestures with wide thresholds and to eliminate less active or less contributing channels of this gesture from the hardware setup to optimise the operational data. The researchers conducted their work with a wearable glove that can produce continuous and variable signals from all its electrodes with respect to the degree of flex being generated by every gesture.

The purpose of the paper titled 'How mutual information interprets anomalies using different clustering techniques' is to evaluate how mutual information interprets

semantic anomalies, using the density-based cluster technique, which is different from the hierarchical-based clustering technique. The research work has identified that cluster analysis can be an appropriate statistical tool for discovering underlying structures in various kinds of dataset.

Academic advising is a time-consuming effort in educational institutions. Online technologies provide various solutions to move conventional advising or face-to-face onto a fully integrated part of the university services, so that students communicate with advisors anytime and anywhere. Advising and consulting students is critical, which can cause latency and additional overhead for both the instructor and student. This paper titled 'A novel integrated framework for securing online instructor-student communication' proposes an effective and secured online framework to enrich the advising experience between the instructor and the student and to enhance time-management. The researchers give a detailed overview of the framework and its various features, and try to prove that the proposed framework would ease the communication and enhance time management issues.

It is our hope that this collection of papers will be a valuable resource for *IJGUC* readers and will stimulate further research into the vibrant area of computational science.