Preface

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Biographical notes: Fadi Al-Turjman received his PhD in Computer Science from the Queen's University, Canada, in 2011. He is an advisor to the Chairman of the Board of Trustees on AI and Informatics at Near East University (NEU), and the Associate Dean for Research in the same university. He is also the Director for the AI and Robotics Institute. He is a leading authority in the areas of smart/intelligent IoT systems. His publication history spans over 600 SCI/E publications, in addition to more than 50 books about AI, cognition, security, and deployment of wireless sensor networks in smart IoT environments.

Al-Sakib Khan Pathan is a Professor at the CSE Department, United International University (UIU), Bangladesh. He received his PhD in Computer Engineering in 2009 from the Kyung Hee University, South Korea, and BSc in Computer Science and Information Technology from Islamic University of Technology (IUT), Bangladesh in 2003. He has served as the Chair and a member in numerous top-ranked international conferences. He is currently the Editor-in-Chief of two journals: *International Journal of Computers and Applications* and *Journal of Cyber Security Technology*. He has edited 28 books and authored six books. He is a senior member of the IEEE.

Fa Zhu is working at the College of Information Science and Technology and College of Artificial Intelligence, Nanjing Forestry University, Nanjing, China. He received his PhD in Control Science and Engineering from the School of Computer Science and Engineering, Nanjing University of Science and Technology, Nanjing, China in 2019. His current research interests include artificial intelligence, pattern recognition, machine learning and internet of things. Most of his works have published on high prestigious journals, including *IEEE Transactions on Neural Network and Learning Systems*, *Pattern Recognition*, *Information Sciences*, etc. He serves/served as associated editor or guest editor of several journals.

With the gradual and awe-inspiring technological advancements, nowadays we see a wide range of use of wearable and portable devices in our daily lives. These devices may be smart watches, smart phones, tablet computers, and so on for instance supporting somatosensory games, controlling door locking systems, turning on or off various devices, and other activities. As the numbers of devices supporting these activities and technologies are increasing, an emerging problem that we have figured out for the next generation smart applications is how to coordinate and interact with these mobile devices. We see that many researchers and practitioners, both in the academia and industries, are trying to come up with various innovative ideas and regulatory rules for such smart systems and environments. Already, we have witnessed that the computer science and behavioural science are introduced to

bridge the gap and increase proper interactions between computers and humans. The internet of things (IoT) is also used to connect mobile intelligent devices with humans. However, these technological means would mainly solve how to connect devices and human beings.

What is critical at this juncture is that we need to improve the quality of service (QoS) and enhance the user experience. Fortunately, artificial intelligence (AI) has appeared as a potential panacea to solve many issues, at least theoretically. Further research works and deep investigations will be needed to turn the ideas into reality and many, in the course of time, may eventually even fail! In fact, the AI or intelligence-based systems open the possibility to mine and disclose the implicit information and human behaviour among the data generated by mobile devices and intelligent sensors. Through discovering the implicit information and knowledge of human behaviour, we may be able to improve the QoS and overall user experience. For instance, a computer-human interaction system can be made smart to exhibit intelligent behaviour with the help of AI technology, which can assist human beings to perform daily mundane tasks with relatively little effort. That is why effective design and optimisation of the intelligent systems are very important for the next generation smart applications to ease human life and experience in using technology.

In this special issue, we offered a platform for both researchers and practitioners to share their latest studies on data analytics, mining, design and optimisation issues for the next generation smart applications. Eventually, we got a good response to receive a good number of submissions, out of which finally we accepted seven papers after the rigorous review process.

The accepted papers have covered various areas within the theme of the special issue. For instance, the paper 'Construction of Simulink-CarSim joint simulation platform for distributed drive electric vehicles', written by Cui and Guo, establishes a joint simulation platform based on CarSim vehicle model and Simulink motor model. The contribution could be useful towards achieving stability and active safety of electric vehicles that we will in plenty in the near future.

The paper titled 'Design of the control system for preventing automobile accelerator from treading on brake mistakenly based on artificial intelligence technology', by He and Lai, combines intelligent control and vehicle braking system to ensure faster response time and reduce the influence of human driving error. This paper can help develop an accurate braking system and a safe distance model.

Again, 'Design and optimisation strategy of linear traffic spatial dynamic vision guidance system based on multi-source data', contributed by Xu and Hu, talks about designing and optimising a linear traffic spatial dynamic visual navigation system based on multi-source data to provide more accurate, real-time, and personalised traffic navigation services.

Zhou et al.'s paper, 'Application of cloud and fog networks and QoS routing optimisation strategies for low delay', addresses the issues of QoS as well as optimisation strategies to ensure low delay environment to improve the operation speed of QoS routing in cloud and fog networks.

Wang et al.'s paper, 'Evaluation of hidden danger types of optical channel performance degradation based on machine learning cascading technology', analyses the causes and characteristics of potential degradation hazards in optical channel (OC) performance, and then uses machine learning algorithms to classify OC performance degradation hazards.

The paper 'Mechanical design and key technology of automatic production line based on artificial intelligence', contributed by Yu and Shan, presents an interesting work which shows that by improving the AI power of the automated production line machinery, enterprises can increase production by an average of 49.6%. This is what we would expect from smart production systems and technologies. However, they also state that improving the balance of automated production lines will not be an easy process.

For developing a smart city for instance, architectural mapping and 3D (three-dimensional) reconstruction are important tasks in the field of modern urban planning and construction. To address this area, in the paper titled, 'Evaluation and exploration of 3D reconstruction based on real-time embedded system in building mapping and surveying', Cheng explores 3D reconstruction based on a real-time embedded system. As the traditional method of building mapping and surveying would require a lot of manpower, the strategies suggested in this work could be helpful in making the task easier and reduce costs and human efforts.

We sincerely thank the contributors as well as those other authors whose papers could not be accepted for this special issue. We hope that the selected papers will satisfy the queries of the research community and provide clear ideas with critical insights into the addressed issues for the current and future researchers.