Editorial

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Biographical notes: K. Shankar received his MCA, MPhil and PhD in Computer Science from Alagappa University, Karaikudi, India. He has several years of experience in research, academia, and teaching. Collectively, he authored/co-authored over 36 ISI Journal articles (with total Impact Factor 96.221). He guest-edited several special issues at many journals published by Inderscience and MDPI. He serves as the reviewer in some SCI indexed journals like IEEE, Elsevier, Springer and the IEEE conferences. His current research interests include secret image sharing scheme, digital image security, cryptography, internet of things, healthcare applications and optimisation algorithms.

Mohamed Elhoseny is currently an Assistant Professor at the Faculty of Computers and Information, Mansoura University where he is also the Director of Distributed Sensing and Intelligent Systems Lab. Collectively, He authored/co-authored over 85 ISI Journal articles in high-ranked and prestigious journals. Furthermore, he has been reviewing papers for 80+ international journals including *IEEE Communications Magazine*, *IEEE Transactions on Intelligent Transportation Systems*, *IEEE Sensors Letters*, *IEEE Communication Letters*, *Elsevier Computer Communications*, *Computer Networks, Sustainable Cities and Society*, *Wireless Personal Communications*, and *Expert Systems with Applications*.

E-governance is an application of information and communication technology (ICT) for offering government services, exchanging data, transactions, integration of existing services, and information portals. The usage of the internet and digital technology is creating a progressive government-public partnership, strengthening government institutions, and integrating all sections of society. Presently, it is tough to imagine human life without the internet and digital technologies. Whether it is transportation, telecommunications, healthcare, security, or education, almost every segment of society is dependent on ICT. To effectively manage these segments of society, our cities need e-administration and governance. Only through proper management of these channels can

our governments design and implement policies which are productive for society as a whole.

As cities are developed based on the smart city model, governments across all regions are using e-governance to strengthen democracy, citizen participation, and public welfare. E-governance aims to make the system more transparent and citizens more informed. Government information will no longer be a repository for a few public officials or servants, but it is accessible by all sections of society. Countries such as India, Bangladesh, Nepal, Nigeria, Angola, and many others are making government information digital across all segments. It led to many positive results and better value for citizens. Some of the challenges that need to be addressed by governments in terms of smart cities are garbage collection, responding to houses on fire and more massive disasters, and facilitating the provision of water, electricity, education, healthcare and the myriad of other services that make life more productive and enjoyable. Urbanisation has now become a global phenomenon, and particular future challenges are common across the cities. As most cities are becoming larger and more complex entities, the management and governance of city systems are inevitably also becoming more complex.

This special issue aims to present new tools and techniques based on statistical models, machine learning, artificial intelligence techniques, internet of things (IoT), intelligent data analysis, and so on assisting the e-governance of smart cities. We asked for original contributions in both theoretical studies and state-of-the-art practical applications. Based on the peer review comments, we carefully selected 13 papers for this special issue. All these 13 papers can be divided into two categories which include into e-healthcare services and smart city management.

There are six articles related to the applications of e-healthcare services to the smart cities. As the number of people who suffer from diabetes mellitus increases significantly, 'A cooperative GA-SM-based prediction model for healthcare services' by M. Durgadevi and R. Kalpana presented a diabetes mellitus prediction model. In this article, genetic algorithm (GA)-based suppressor mutation (SM) optimisation rule miner has been proposed as a cooperative approach for prediction of diabetes mellitus. A novel fitness function has been incorporated into the GA-SM approach to generate a comprehensive optimal rule set while balancing accuracy, sensitivity and specificity. The proposed rule-miner was compared against three rule-based algorithms, namely CN2, J48 and BFtree on the Pima Indians Diabetes dataset with 768 patient records using 10-fold cross validation. The results obtained prove that the proposed GA-SM approach has outperformed CN2, J48 and BFtree with respect to accuracy and kappa.

'An analysis of parallel ensemble diabetes decision support system based on voting classifier for classification problem' by S. Sathurthi and K. Saruladha developed a voting classifier for combining the various ensemble and base classifiers for designing diabetes disease prediction. Voting mechanism helps to build the multiple ensemble and base classifier model. The accuracy of ensemble of ensemble classifiers has resulted in high rate of accuracy (79%) when compared to the ensemble of base classifiers (77%) with majority rule voting (MRV) and weighted majority voting (WMV) models. Hence ensemble of ensemble classifier was chosen as the best model for diabetes healthcare prediction. This system has been experimented with Pima Indian Diabetes UCI dataset and it is implemented in Python language.

'Identification and characterisation of choroidal neovascularisation using e-health data through an optimal classifier' G. Anitha, Mohamed Ismail and S.K. Lakshmanaprabu developed an optimal classification model for the identification and characterisation of choroidal neovascularisation (CNV) using e-health data. CNV is a retinal disease caused due to the growth of abnormal blood vessels in the choroidal layer. These new blood vessels break through the barrier between retina and choroid. When they enter into retina it will cause severe vision loss. Hence, identifying this disease in the earlier stages will help the medical practitioners to give the treatment at the right time. This paper made a comparison study among different machine learning classifiers such as Decision tree, support vector machine (SVM), k-nearest neighbours (kNN), neural network (NN), ensemble and naïve Bayes classifiers. The concerned classifiers are tested and evaluated based on accuracy and training time. The experiments successfully show that en e-health-based supporting system with kNN classifier generates better results and classifies subjects more accurately than the other machine learning classifiers.

'An efficient healthcare framework for kidney disease using hybrid harmony search algorithm' by Prasad Koti, P. Dhavachelvan, T. Kalaipriyan, A. Sariga, J. Uthayakumar and P. Sujatha presented a hybrid harmony search (HM-L) algorithm with Levi distribution to properly predict kidney disease at appropriate time. In this research work, correlation-based feature selection (CFS) is used as a feature selection technique. The effectiveness of hybrid harmony search (HS) algorithm is validated by employing it against a set of dataset. The obtained results of applied datasets without and with feature selection are compared to one another. The experimental results imply that the HM-L algorithm attains significant results than existing methods such as HS algorithm, biogeography optimisation algorithm (BBO), grey wolf optimisation (GWO), AL particle swarm optimisation algorithm (ALPSO) and artificial bee colony (ABC) algorithm. The presented HM-L model attains a sensitivity of 96, specificity of 93.33, accuracy of 95, F-score of 96 and kappa value of 0.89.

'Internet of medical things with Cloud-based e-health services for brain tumour detection model using deep convolution neural network' by M. Ganesan, N. Sivakumar, M. Thirumaran has developed an IoT with cloud based brain tumour detection model using convolution neural network (CNN). Here, the input MRI brain images are captured by the use of medical equipments as well as IoT devices is used to transmit data to the cloud. In the cloud, the D-CNN model can be executed to identify the presence of disease and classify the brain tumour as malignant or benign. It will be helpful for the remote patients to get the reports immediately. The presented D-CNN model is employed to a set of benchmark BRATS 2015 Challenge dataset. The experimental analysis is carried out on the test images and the results are determined interms of sensitivity, accuracy, and specificity. The presented model attains maximum classifier performance with the sensitivity value of 97.17, specificity of 98.77 and accuracy of 98.07.

'A framework for e-healthcare management service using recommender system' by P. Nagaraj, P. Deepalakshmi significantly contributes the understanding of E-healthcare services in recommendation systems. A majority of e-healthcare services are published in expert systems with applications. A completely incorporated and thorough medicinal services framework that incorporates the coordinated interconnection and association of the patient and so on is presented. The proposed framework can classify new medical cases and thus support physicians to take more correct and reliable actions about specific diagnosis, cares and services.

A total of remaining seven articles have contributed to the smart city management by developing efficient methodologies related to data mining, disaster prevention, image processing and wireless sensor networks. Personalised e-learning environment provide recommendations to learning community for supporting and also helping them go through the process of e-learning, as it plays a crucial role in promotion of smart learning in smart cities. 'Smart learning using personalised recommendations in web-based learning systems using artificial bee colony algorithm to improve learning performance' by Maganti Venkatesh and S. Sathyalakshmi presented a novel framework called personalised bee recommender for e-learning (PBReL)-based ABC optimisation to build a structure of recommendation by using K-Means clustering. Many other recommender system are available that made use of ABC to identify its optimal learning path. Experiments are carried out by using web links and contents of Moodle-based learning management system (LMS). Results show that the proposed framework obtains higher precision and coverage.

Many government schemes were unsuccessful because lack of proper feedback on the on-going schemes, where billion dollars investment is going to be in vain. Sentiment analysis is one of best approach to analyse opinions of the people on various government schemes. Sentiment analysis and machine learning techniques emerged to analyse huge social media corpora to track people's views on government policies, products and services. 'Empower good governance with public assessed schemes by improved sentiment analysis accuracy' by Akula .V.S. Siva Rama Rao and P. Ranjana has proposed an un-prejudice light stemming algorithm prevent etymology behaviour of morpheme and sustain its meaning during stemming process by selecting a word which has maximum number of synonyms in lexical database.

Security is a major concern that has been opting for users to handle their data privacy. Several researchers have studied and developed a major concept of using big data with social internet of things (SIoT) and the security development of maintain a large amount of data. In 'Social internet of things using big data analytics and security aspects – a review' by S. Deva Arul and Meenakshisundaram Iyapparaja, a deep survey regarding the concepts behind the big data analytics with the SIoT is studied and analysed. Furthermore, the machine learning techniques that were used in previous works were analysed and comparisons of various methods are discussed. The performance comparison of various classifiers on different datasets is shown and SVM has more than 90% of accuracy when compared with other algorithms. KNN has 64% of accuracy which is lowest of any classifier than NB and NN.

Riyadh is one of the smart cities in Kingdom of Saudi Arabia. Dust storm and floods are the most common hazards in the city. Existing smart city management could not provide an effective solution for the natural hazards. There is a necessity for smart city applications to optimise data and provide an optimum accuracy in output. 'Managing natural hazards in smart cities in Kingdom of Saudi Arabia using a technique based on interior search algorithm' by Ashit Kumar Dutta offered a solution for natural hazards and provides effective management of Riyadh city. A machine learning technique, interior search algorithm is used in the proposed study. It is used in the research for the extraction of knowledge from complex data. The efficiency of proposed method is compared with state of the art algorithms. The proposed method has achieved an accuracy of 87% in the management of natural hazards.

System lifetime is the crucial problem of wireless sensor networks (WSNs), and exploiting environmental energy provides a potential solution. Boost converter can be employed in WSN to achieve energy efficiency. In order to eradicate the issue of boost converter, PID controller is combined with boost converter to minimise the error rate and achieve better output voltage. However, tuning the PID controller is crucial task whenever the input voltage fluctuates. 'Optimal parameter tuning for PID controller using accelerated grey wolf optimisation in smart sensor environments' by R. Rajakumar, D. Sivanandakumar, J. Uthayakumar, T. Vengattaraman and K. Dinesh presented a meta-heuristic algorithm namely accelerated grey wolf optimisation (AGWO) to improve the convergence speed and eradicate the local optima stagnation. AGWO algorithm uses efficient intensification (BFGS) and diversification (Levy flight) techniques to avoid the local optima struck and premature convergence. In addition to that diversity measure is incorporated to balance the intensification and diversification search in order to identify the optimum solution. The experimental results demonstrate that AGWO enhances the diversity of the search agents and provides better search effectiveness and efficiency in solving the PID controller when compared with other variants of meta-heuristic approaches. The observed results convey that AGWO achieves minimum percentage overshoot (9%), settling time (0.894), rise time (0.50) and peak time (0.57) which is better compared to other comparative algorithms. Additionally, it has been observed that AGWO is able to achieve comparatively better success performance though it is more complex and the performance of AGWO is promoted by selecting the appropriate parameter value for PID Controller.

'Social spider-based unequal clustering protocol for wireless sensor environment for smart cities' by R. Buvanesvari and A. Rijuvana Begum presented a social spider-based unequal clustering protocol (SSUCP) for WSN. SSUCP is based on the nature of social spiders to select the proper CHs and cluster size. Based on the fitness functions and node parameters, the interested decision of selecting the proper CHs and cluster size were made. The SSUCP is implemented in MATLAB and an extensive experimentation takes place under three situations based on distance to BS for ensuring the consistent results of the proposed method. In addition, the SSUCP is validated interms of energy efficiency and network lifetime analysis. The attained experimental outcome verified that the SSUCP is the superior one over the compared methods.

Stereo vision is a subfield of computer vision that tends to an essential research issue of reproducing the three-dimensional directions and focuses for depth estimation. 'A performance analysis of stereo matching algorithms for stereo vision applications in smart environments' by V. Kavitha and G. Balakrishnan provided a relative investigation of stereo vision and matching techniques, utilised to resolve the correspondence problem. The investigation of matching algorithms is done by the use of extensive experiments on the Middlebury benchmark dataset. The tests concentrated on an examination of three stereovision techniques namely mean shift algorithm (MSA), seed growing algorithm (SGA) and multi curve fitting algorithm (MCF). With a specific end goal to evaluate the execution, some statistics related insights were computed. The experimental results demonstrated that best outcome is attained by the MCF algorithm interms of depth estimation, disparity estimation and CT. The presented MCF algorithm attains a minimum computation time (CT) of 2 s whereas the other MSA and SGA require a maximum CT of 8.9 s and 7 s respectively. The simulation results verified that the MCF algorithm reduces the processing time in a significant way than the compared methods.

In conclusion, this special issue would not have been possible without the help of many people. As guest editors, we would like to take this opportunity to thank the authors for their contributions and the reviewers for their invaluable comments and timely responses. We also would like to thank the *Electronic Government, an International Journal*, Editor-in-Chief and staffs for their support during the preparation and production of this special issue.