# Guest Editorial Preface

# Special Issue on Internet of Things, Next Generation Networks, Data Mining and Cloud Computing 2016, Part 2

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The current era witnesses the enormous usage of automation and intelligent machines. The soft computing emerges with numerous modeling techniques. The problems are resolved using different machines learning, soft computing and Internet of things domains. In order to realizes the dream of IoT, smart cities and soft computing, across the globe lot of research works are going on and in parallel the industry are giving the products to materialize these goal. The main idea of this Special issue is to cover both the theory and applications issues from researcher, academicians, scientists and engineers covering a wide range of areas to present their latest research findings in Internet of Things, Smart cities, soft computation techniques and related areas to identify present problem's solution and future challenges in the combination of research areas.

There is a rich literature on the topic and numerous advancements have appeared in the past decade with the focus on improved security against various privacy attacks in the cloud computing environment. Demand of security assurance against emerging privacy attacks makes the task of maintaining output's utility to public become ever more challenging. At present, the underlying mobility of services remains limited: end-user services other than voice are hardly portable across networks. This functionality is central to exploiting thing-to-thing communications. In this respect, next-generation networks hope to offer mobility much more broadly. "Generalized mobility" is a term closely associated with NGN. It denotes the possibility of seamless and ubiquitous access to services, irrespective of location and the technology used.

NGN is a broad concept, and there are several definitions of NGN at this time. ITU formally defines NGN as a "packet-based network able to provide telecommunication services and make use of multiple broadband transport technologies in which service-related functions are independent from underlying

transport-related technologies".8 In general, most analysts describe NGN as a multi-service network based on Internet Protocol (IP) technology. NGN will address both network and service elements, providing new opportunities for service providers, operators, content developers, manufacturers and users. The use of data search capabilities and statistical algorithms to search existing databases for patterns and correlations between them that give new meaning to their data content is data mining. Data Mining is recently a new trend used to identify large data sets due to complexity, cardinality and continuality.

In this regards First Paper on An optimal context Aware Routing Algorithm for WSNs in IoT networks. Recent research deeds capitalizing on the state of the art technologies to build a scalable IoT. Internet of Things (IoT) alludes to the development of Internet technologies to incorporate wireless sensor networks and smart objects by extensive interfacing of exclusively identifiable, distributed communication devices. The capacity to include remote sensing points range as an immense necessity. It marks importance of costless running wires, which give way for numerous gains like Energy and Material savings. In Internet of things and its relevant technologies such as wireless sensor networks, the routing of data plays one of the major roles. However, in the routing mechanism, the selection of reliable path is a complex task. In this paper, a novel routing algorithm is presented for the networks consisting of smart objects, so that the wireless sensor networks can provide high reliability while the transmitting the data. The proposed technique executes in two stages. In first stage, the sensor nodes are clustered and an optimal cluster head is selected by using k-means clustering algorithm. The clustering is performed based on energy of sensor nodes. Then the energy cost of the cluster head and the trust level of the sensor nodes are determined. At second stage, an optimal path will be selected by using the Genetic Algorithm (GA).

Second paper is on An Evolutionary Mobility Aware Multi-Objective Hybrid Routing Algorithm for Heterogeneous WSNs. Researchers have faced numerous challenges while designing WSNs and protocols in many applications such as object tracking in military, detection of disastrous events, environment, and health monitoring, etc. Amongst all sustaining connectivity and capitalizing on the network lifetime is a serious deliberation. To tackle these two problems, Mobile Wireless Sensor Networks (MWSNs) is a better choice. In this paper, the authors put forward an Evolutionary Mobility aware multi-objective hybrid Routing Protocol for heterogeneous wireless sensor networks (EMRP).

EMRP uses two-level hierarchical clustering. EMRP selects the optimal path from source to sink using multiple metrics such as Average Energy consumption, Control Overhead, Reaction Time, LQI, and HOP Count. The authors study the influence of energy heterogeneity and mobility of sensor nodes on the performance of EMRP.

Third Paper is on IoT Setup for Co-measurement of Water Level and Temperature. Recent time has witnessed severe scarcity of water owing to deficient rainfall in India. The current climatic conditions in the country, project the rise in temperature and arid conditions contributing substantially towards the evaporation losses. In order to deal with the looming crisis, it is peremptory to minimize evaporation losses in the water bodies, at least measure them to get a fair idea and initiate corrective measures. This paper aims to develop a system to continuously monitor the water level as an indicator to the evaporation process. The system also indicates temperature of the water which influences the evaporation rate.

Fourth Paper is on video stenographic techniques. Steganography is one of the oldest data protecting methodologies deals with the embedding of data. Video Steganography hides secret information file within a video. Present day communications are treated to be “un-trusted” in terms of security, i.e. they are relatively easy to be hacked. The proposed technique is invented to hide secret information into a video file keeping two considerations in mind which are size and security of the cover video file. At the sender side, the secret information which is to be hidden is encoded into cover video file. Double layered security for the secret data can be achieved by encrypting confidential information and by embedding confidential information into cover video file frames using encrypted embedding technique. Performance of the cover and stego video file are evaluated. The results are in expected line and are comparable with the already existing results.

Fifth paper says about Supervised Convolutional Neural Network and Its Major Applications. The remarkable increase in the computational power of convolutional neural network is due to the use of Graphics processor units, parallel computing, also the availability of large amount of data in various variety forms. This paper gives the broad view of various supervised convolutional neural network applications with its silent features in the fields of mainly Computer vision for Pattern and Object Detection, Natural language processing, Speech recognition, Medical image analysis. As

computers become more and more powerful, CNN proves to be one of the best algorithms for pattern recognition as well as classification problems.

Sixth paper is on call admission control in next generation wireless mobile communication. To handle handoff calls and new calls in cellular network channel reservation scheme have been already proposed to reserve system bandwidth for higher priority call for CAC. This earlier proposed scheme is not as per the required level of satisfaction because the available reversed bandwidth is not allocated properly in case of least handoff rate. In this, we like to present a new channel borrowing scheme where new non real time (NRT) calls can make use of reserved channels. It can borrow this reserved channel on a temporary basis and after this immediately, if any handoff calls enter, the current cell and no any other channels are available then it will pre-empt the channel from earlier borrowed NRT user if exists. This pre-empted NRT call is kept in the priority queue to consider its service when any channel becomes free. The number of NRT calls in the queue should not be large to avoid delayed service. The fundamental objective of the proposed scheme to design of the system for evaluating the results and comparing with the results of the existing system.

Seventh Paper is on QoS in IoT. To deal with huge number of devices in a network we need to consider Quality of Service (QoS)parameters so that system operations can be performed in a smoother way. Mathematical modelling of these QoS parameters gives an idea about which factors are needs to consider while designing any IoT-enabled system at the same time it will give the performance analysis of the system before implementation. In this paper comprehensive literature survey is done to discuss various issues related to QoS and gap analysis is also done for IoT Enabled systems. This paper proposes general steps to build a mathematical model for a system.

Eight paper says about big data. In recent years, with the rapid development of the Internet, network service has become one of the most frequently used computer applications. Search engine, webmail, and social network services are presently crucial data intensive applications. Search engine, webmail, and social network services are presently crucial data intensive applications. Because increasingly more people use web services, processing a big amount of data efficiently can be a significant problem. The very word “Big” indicates size. Big data have rapidly developed into a hotspot that attracts great attention to academia, industry, and even governments around the world. The result from various simulations using Iris data set shows that the proposed clustering algorithm performs better than K-means and K-medoid clustering, which helps to improve the quality data summarization. Traditional document summarization methods are restricted for summarizing suitable information from the big document data whereas in the proposed big data summarization which the information is summarized from a big document data. F-score and Time complexity of proposed system is better than LSA and BDS

As guest editors, we hope that spectrum of research works covered under this special issue will be of value for multitude of readers/researchers working in the domain Internet of Things, Next Generation Networks, Data Mining and Cloud Computing. At the same time, we are also grateful to the authors for making their valued research contributions to this issue and their patience during crucial revision stages. The technical standards and quality of published content is based on the strength and expertise of the reviewer board members who have been grossly involved in providing high quality reviews for the submitted papers. Our special thanks go to the Editor-in-Chief of the International Journal of Rough Sets and Data Analysis (IJRSDA), Dr. Nilanjan Dey for all his help, support, efficiency and competence rendered to this special issue.

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