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Guest editorial: Selected papers from the ubiquitous clouds and cognitive communication networks (ucccn 2019)

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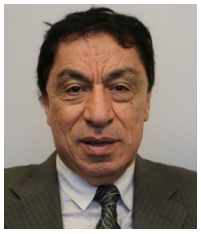
Cloud computing delivers information processing, storage, and computing power services over a network rather than physically having the computing hardware and software resources at a centralised location. Amazon Web Service (AWS), IBM Cloud Services, MS AZURE, Google Cloud Platform, VMware, Adobe Creative Cloud, Oracle Cloud, and Red Hat are the top cloud services users and providers. Cloud computing is a complex and extensive distributed environment and is heavily dependent on elaborate scheduling, tasks assignment, shared memory architectures, message passing interfaces (MPI), shared storage management, database redundancy, security, and a vast variety of sophisticated algorithms.

The evolution of cloud computing was enabled by other mature technologies starting with the mainframe in the 1950's, which allowed multiple users shared access to a central computer through primitive dumb terminals. The costs to buy and maintain mainframe computers were excessive and required complex support and high costs in maintenance. The introduction of desktop personal computers and workstations in the 1980's, in addition to mature networking technologies in the 1990's, provided an alternative replacement to mainframes. These developments allowed extensive research and collaboration between high-tech IT companies, research laboratories, and top universities to produce enabling technologies to allow distributed computing in both heterogeneous and non-heterogeneous workstation networks. This effort produced two successful architectures: the message passing interface (MPI) and shared memory (SM) distributed computing.

The availability of matured virtual machines (VM), the strong spread of electronic commerce, the global economy, and the exponential growth of the Internet in the late 1990's, produced successful and competitive cloud computing systems. Using virtualisation software like VMware, it is possible to execute one or more operating systems simultaneously in an isolated environment. Complete virtual computers can be executed inside one physical hardware which in turn can run a completely different operating system. Virtualisation was a key driver of cloud computing technology, and was also an important catalyst in advancing communication and information technology throughout the world. Historically, telecommunications and IT service providers mainly ran on single, dedicated, point-to-point data connections. The newly offered virtualised private network connections had the same service quality as the former dedicated services at a fraction of the cost. Telecommunications companies are now able to provide users with shared access to more advanced and powerful virtualised physical infrastructure.

Cloud computing is a multi-faceted technology, enabled through the use of advanced and extremely complex algorithms including; advanced communication and networking techniques, scheduling of hardware resources, tasks assignments, security techniques, advanced distributed databases, and user friendly client / user interfaces. This Special Issue in *IET Networks* presents advanced research papers covering important aspects of cloud computing new developments; including Authorisation, attack detection and avoidance, framework for Internet of Things devices, virtual machine placement in cloud environments, conventional machine learning algorithms for massive volumes of data, and specialised antennas for high-speed cloud communication. As Guest Editors of this Special Issue, we are confident that it will contribute to the advancement of cloud computing technology and aid other researchers in extending the included work to more advanced and comprehensive achievements.

Guest Editor Biographies



Dr. Kamel is currently a Professor of Computer Science at TSU. He worked as full time faculty and administrator at Texas Southern University and the University of Louisville. He was the founding dean of the College of IT at the United Arab Emirates University and the College of CS & IT at the Abu Dhabi University. Dr. Kamel received a BS in Electrical Engineering from Cairo University, a BS in Mathematics from Ain Shams University, an MS in CS from Waterloo University, and a PhD in ECE from the University of Cincinnati. Dr. Kamel worked as principle investigator on several government and industry grants. He has also supervised over 100 graduate research Master and Doctoral students in the past 35 years. His current research interest is more interdisciplinary in nature but focuses on the use of IT in Industry and systems. Dr. Kamel's area of expertise is PLC Process Control / Automation, Microcontrollers Based Embedded System Design, and Computer Networks.

Dr. Jennifer S Raj received a PhD degree from Anna University and Master's Degree in communication System from SRM University, India. Currently she is working in the Department of ECE, Gnanamani College of Technology, Namakkal, India. She is a life member of ISTE, India. She has been serving as Organising Chair and Program Chair of several International conferences, and in the Program Committees of several International conferences. She is book reviewer for Tata McGraw hill publication and publishes more than fifty research articles in journals and IEEE conferences. Her interests are in wireless Health care informatics and body area sensor networks.

Dr. Joy Iong-Zong Chen is currently a full professor of Department of Electrical Engineering Dayeh

University at Changhua Taiwan. Prior to joining the Dayeh University, he worked at the Control Data Company (Taiwan) as a technical manager since Sep. 1985 to Sep. 1996. His research interests include wireless communications, spread spectrum technical, OFDM systems, and wireless sensor networks. He has published a large number of SCI Journal papers in the issues addressing physical layer for wireless communication systems. Moreover, he also majors in developing some applications of IOT (Internet of Thing) techniques and owns some patents authorised by the Taiwan Intellectual Property Office (TIPO).

Dr. Ivan Kotuliak is a full professor focusing on communication technologies, security aspects including blockchain. Currently, he is also serving as Slovak representative in Information for All Programme (IFAP) within UNESCO, consultant for blockchain technology in the Office of the Deputy Prime Minister of the Slovak Republic for Investments and Informatisation and advisor to the dean.