Special Issue on Cognitive Smart Cities: Challenges and Trending Solutions

Overview

A smart city implies the ability of sustainable city growth using technology-based solutions to give a decent quality of life to the citizens. Information and communication technologies (ICT) play a crucial role as the nerve center of the smart city for collecting and analyzing data sets from various sources like mobile, social media, and sensors. IoT and big data play a crucial role in building the smart city infrastructure as these revolutionize the way we analyze patterns and trends in human behavior. Smart cities have a huge data input, and many ways to process andimplement that data.

Recently, cognitive analytics as a technology-based solution has attracted a lot of attention by both researchers and practitioners. It is a novel approach to information discovery and decision making which uses multiple intelligent technologies such as machine learning, deep learning, artificial intelligence, natural language processing and image recognition among others to understand data & then generate insights. A cognitive smart city refers to the convergence of emerging IoT and smart city technologies, their generated big data, and artificial intelligence techniques. A cognitive city is one that learns and adapts its behavior based on past experiences and can sense, understand and respond to changes in its environment. In cognitive cities, data now flows not only from the citizens to and from city management (as in smart cities), but also from citizen to citizen, and citizen to system. The citizens' act as human sensors and the intelligence framework evolves to a cyber-physical-social system. Thus, a consistent citizen engagement, ubiquitous data collection, and sophisticated analytics can lead to the shift to produce the best kind of cognitive city.

The implementation of cognitive smart city is highly context dependent (nations, government etc.). The initiatives may range from incremental to disruptive and the deployment is shaped by many factors, such as, governance, economic, technology, social, environmental, legal and ethical. As smart cities projects become more pervasive across each region and geography, technology and applications, it is imperative to identify key learnings to foster a deeper understanding of the technology evolution landscape and create tangible benefits to smart city planners and key decision-makers. Viable intersection between technology solutions and digital urbanization design principles (People-Centered and Inclusive Infrastructure; Resilience and Sustainability; Interoperability and Flexibility; Managing Risks and Ensuring Safety) need to be evaluated in order to provide balanced and replicable solutions.

In the research community, there are several works that propose cognitive solutions that fit the needs of sustainable urban development. Specific primary and review literature, web content, government consultation documents and policy papers articulate numerous challenges and trending research directions for incorporating cognition to realize new smart city services. Both qualitative and quantitative research methods carefully consider massive data analytics, semantic derivation and knowledge discovery, intelligent decision-making,

and on-demand service provisioning for large number of smart city applications.

This special issue aims to stimulate discussion on the design, use and evaluation of selfcorrecting and human cognition for continuous learning as the key knowledge discovery drivers within the socially connected urban ecosystem. We encourage submission of articles describing cognitive models for Cyber–Physical–Social Urban Big-Data Systems to leverage deeper insights from the vast amount of generated data delivering a near real-time intelligence. Articles may include a mixture of theoretical, conceptual and empirical cases and a range of research methods and must demonstrate how they will make a significant and lasting contribution to the field.

Topics of interest include, but are not limited to:
- Information extraction and knowledge representation in cognitive smart cities
- Learning in cognitive smart cities
- Big data-driven cognitive computing
- Cognitive modeling
- Cognitive sensor-networks
- Cognitive robots, chat-bots and agents
- Brain inspired cognition analytics and computing
- Internet of cognitive Things
- Multi-modal interfaces in cognitive smart cities
- High performance computing for cognitive smart cities
- Cyber-physical-social systems and society
- Privacy preservation and security in cognitive smart cities
- On-device intelligence and context awareness
- Integration of semantic technologies

Submission Instructions
Solicited original submissions must not be currently under consideration for publication in other venues. Author guidelines and submission information can be found at Expert Systems, Wiley. All manuscripts should be submitted through portal and select our SI theme. Each paper will be reviewed rigorously, and possibly in two rounds, i.e., minor/major revisions will undergo another round of review. Prospective authors are invited to submit their papers directly via the online submission system at https://submission.wiley.com/journal/exsy for this special issue.

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Important Dates:
Submissions Deadline: March 1, 2021
First Reviews Due: May 1, 2021
Revision Due: June 1, 2021
Second Reviews Due/Notification: July 15, 2021
Final Manuscript Due: August 15, 2021

Guest Editor Profiles

Varun G Menon is currently Associate Professor in Computer Science Engineering, International Collaborations and Corporate Relations in charge at SCMS School of Engineering and Technology, SCMS Group of Educational Institutions, India. He is a Senior Member of IEEE and Distinguished Speaker of ACM. He is currently a Guest Editor for IEEE Transactions on Industrial Informatics, IEEE Sensors Journal, IEEE Internet of Things Magazine and Journal of Supercomputing. He is an Associate Editor of IET Quantum Communications and an Editorial Board Member of IEEE Future Directions: Technology Policy and Ethics. He is serving in the Editorial Review Boards of many journals including Journal of Organizational and End User Computing, International Journal of E-Health and Medical Communications, International Journal of Disaster Response and Emergency Management. He is currently serving in the Review Boards of many high impact factor journals including IEEE Transactions on Intelligent Transportation Systems, IEEE Internet of Things Journal, IEEE Transactions on Vehicular Technology, IEEETransactions on Communications, IEEE Transactions on Industrial Informatics, IEEE Transactions on Green Communications and Networking, IEEE Communications Magazine, IEEE Access, IEEE Vehicular Technology Magazine, Ad-Hoc Networks Journal (Elsevier), Computer Communications Journal (Elsevier), Vehicular Communications Journal (Elsevier). Dr. Menon received the Top Peer Reviewer Award by Publons in 2018 and 2019. He has served over 20 conferences like IEEE ICC, ICCCN 2020, IEEE COINS 2020, SigTelCom, ICACCI, ICDMAI in leadership capacities including program co-Chair, track Chair, session Chair, and Technical Program Committee member. His research interests include Internet of Things, 5G and 5G communications, Fog Computing and Networking, Underwater Acoustic Sensor Networks,Information Science, Scientometrics, Informatics of Scientific Databases, Educational Psychology, Cyber Psychology, Hijacked and Predatory Journals, Ad-Hoc Networks, Wireless Communication, Opportunistic Routing, Wireless Sensor Networks.

Mohammad Khosravi is currently associated with Persian Gulf University, Iran. He has served/is serving as an International Committee Member of the conferences of IEEE-ICCC 2017 & 2018, ICEOE 2018 & 2019, SPIE-IWPR 2018 & 2019, ACM-ICBCT 2019 and ACM-BIOTC 2019. In addition, he is currently serving as an Assistant/Guest Editor of Springer Nature Applied Sciences and The Journal of Supercomputing. From 2017 to 2019, he was an Academic Editor at Bentham Science. Mohammad is an active reviewer of many top journals of IEEE, IET, Springer, Emerald and Elsevier. His main interests include Statistical Signal and Image Processing, Medical Bioinformatics, Radar Imaging and Satellite Remote Sensing, Computer Communications, Wireless Sensor Networks, Underwater Acoustic Communications, Information Science and Scientometrics.

Dr. Alireza Jolfaei received the Ph.D. degree in Applied Cryptography from Griffith University, Gold Coast, Australia. He is an Assistant Professor in Cyber Security at Macquarie University, Sydney, Australia. Prior to this appointment, he worked as an Assistant Professor at Federation University Australia and Temple University in Philadelphia, USA. His current research areas include the cyber security of industrial automation and control systems and cyber physical systems security. He has authored over 50 peer-reviewed articles on topics related to cyber security. He has received multiple awards for Academic Excellence, University Contribution, and Inclusion and Diversity Support. He received the prestigious IEEE Australian council award for his research paper published in the IEEE

Transactions on Information Forensics and Security. He received a recognition diploma with cash award from the IEEE Industrial Electronics Society for his publication at the 2019 IEEE IES International Conference on Industrial Technology. He is a founding member of IEEE Northern Territory Section and Federation University IEEE Student Branch. He served as the Chairman of Computational Intelligence Society in IEEE Victoria Section and also as the Chairman of Professional and Career Activities for IEEE Queensland Section. He has served as the guest associate editor of IEEE journals and transactions, including IEEE IoT Journal and IEEE Transactions on Industrial Applications. He has served over 10 conferences in leadership capacities including program co-Chair, track Chair, session Chair, and Technical Program Committee member, including IEEE TrustCom and DependSys. He is a Senior Member of the IEEE.

Akshi Kumar is an Assistant Professor in the Department of Computer Science & Engineering at Delhi Technological University (formerly Delhi College of Engineering). She has been with the university for the past 10 years. She has received her Ph.D. in Computer Engineering from Faculty of Technology, University of Delhi in 2011. She completed her Master of Technology with honours in Computer Science & Engineering from Guru Gobind Singh Indraprastha University, Delhi in 2005. She received her Bachelor of Engineering degree with distinction in Computer Science & Engineering from Maharshi Dayanand University, India in 2003. She has presented several papers in international conferences and published work in peer-reviewed and science cited journals. Dr. Kumar has also authored a book 'Web Technology: Theory and Practice' published by CRC Press, Taylor and Francis Group. Her research interests are in the area of intelligent systems, social media analytics, cognitive analytics and soft computing.

Vinod P is Post-Doctoral fellow in Department of Mathematics, University of Padova, Italy, working with Prof. Mauro Conti. He is part of the Security and PRIvacy Through Zeal (SPRITZ) research group and currently working on a European H2020 project, TagItSmart! - Smart Tags driven service platform for enabling ecosystems of connected objects. He obtained PhD in Computer Engineering from National Institute of Technology, Jaipur, Rajasthan, India, in 2012. He is also a visiting Post Doctorate Fellow on Information Security, in the project funded by Information Security & Education Awareness (ISEA) at Malaviya National Institute of Technology, Jaipur, Rajasthan, India. His research interests are in Detection of malicious code in mobile and desktop systems, Machine Learning, Natural Language Processing, Image Security and Vulnerability assessment and countermeasures.