DOI: 10.1049/smc2.12024

The Institution of Engineering and Technology WILEY

GUEST EDITORIAL

Guest editorial: Smart computing for smart cities

Smart computing has a big role to play in the development of the smart cities. The advanced networking paradigms such as programmable and virtual networks, growth in communication technologies like 5G, and use of advanced computing infrastructure such as fog/edge/cloud computing can all contribute in the applications related to smart cities. With the penetration of Internet of things (IoT) devices in smart city applications, smart computing has become all the more relevant in terms of managing and processing the data. The applications in smart cities can be computing-intensive, network-intensive, disk-intensive, data-intensive etc., which require different solution sets in order to effectively solve the issues pertaining to these applications. The computing and communication aspects in smart computing are of great relevance in the wider domain of smart cities, which consists of smart metering, smart homes, smart building, smart industries, connected vehicles, and tackles various problems ranging from data reporting to providing smart services.

Hence, the aim of this special issue is to bring together researchers working in the broad area of smart cities using smart computing. A number of authors from the 2nd International Workshop on Smart Computing for Smart Cities were invited to expand and submit their papers to this special issue alongside papers received from our open call for papers. The summary of each paper is provided below. Please read the full papers if you are interested in more details.

Nassar and Simon, in their paper 'Wavelet-attention-based traffic prediction for smart cities', proposed a wavelet-attention based traffic prediction system to predict the temporal correlations between the traffic flow and the weather factors, so as to reduce the traffic congestion problem in smart cities. Often the traffic is affected by external factors, such as weather, which makes traffic prediction more complicated. Their proposed paper modelled the interactions between traffic and these external factors such as temperature, visibility, wind speed, rain, and humidity, based on which the important features are then calculated and compared to each other to get the attention weights that describe the importance of each external factor on traffic.

Fitwi et al., in their paper 'Lightweight frame scrambling mechanisms for end-to-end privacy in edge smart surveillance', investigated a very interesting and timely problem of smart surveillance and provided a lightweight frame scrambling mechanism for ensuring end-to-end privacy in such systems. The authors rightly pointed out that existing cryptographic schemes are computationally expensive if data is to be processed at the resource constrained network edge devices. Keeping this in mind, they designed a lightweight sine-cosine chaotic map solution for enciphering frames at edge cameras and ran dynamic chaotic image enciphering scheme in real time at the edge along with a lightweight region of interest masking scheme to ensure the privacy of sensitive attributes such as face in the surveillance feeds.

Dudeja et al., in their paper 'An optimal content indexing approach for named data networking in software-defined IoT system', touched upon another important aspect of smart cities, that is, Internet of things (IoT). To fulfil the demand by allowing the content to be directly addressable and routable, the authors leveraged a content-centric networking-based named data networking technique in the IoT ecosystem. The authors proposed a novel content storage/indexing approach for the selection of appropriate nodes and red-black tree-based content storage and retrieval from the available caching memory to work on the software-defined controller deployed over the named data network.

The papers in this special issue shed light on different aspects of smart computing in smart cities. We would like to thank the authors for submitting their work to this special issue, reviewers for timely review and suggesting improvement comments, and the editorial team of IET Smart Cities for smooth handling of the whole process.

Anish Jindal[1,2]
Angelos K. Marnerides[2,3]
Petros Spachos[4]
Amit Dvir[5]

[1]*University of Essex, Colchester, UK*
[2]*Durham University, Durham, UK*
[3]*University of Glasgow (UoG), Glasgow, UK*
[4]*University of Guelph, Guelph, Ontario, Canada*
[5]*Ariel University, Ariel, Israel*

Correspondence
Anish Jindal, University of Essex, Colchester, UK.
Durham University, Durham, UK.
Email: anish.jindal@durham.ac.uk, a.jindal@essex.ac.uk

ORCID

Anish Jindal https://orcid.org/0000-0002-3052-2892
Petros Spachos https://orcid.org/0000-0001-8004-0907
Amit Dvir https://orcid.org/0000-0002-3670-0784

AUTHOR BIOGRAPHIES

Dr. Anish Jindal is working as a Assistant Professor in Department of Computer Science, Durham University and Visiting Fellow in School of Computer Science & Electronic Engineering, University of Essex, UK. He is the recipient of the Outstanding Ph.D. Dissertation Award, 2019 from IEEE Technical Committee on Scalable Computing (TCSC) and IEEE ComSoc Outstanding Young Researcher Award for the Europe, Middle East, and Africa (EMEA) Region for 2019. He has many research contributions in the area of smart grid, data analytics, vehicular cyber-physical systems, wireless networks, and security.

Dr. Angelos K. Marnerides is an Associate Professor in the School of Computing Science (SoCS) at the University of Glasgow (UofG) leading the Glasgow Cyber Defence Group and coordinating all cybersecurity research activities across all the research sections at UofG SoCS. His research revolves around measurement-based security and resilience for Internet-enabled cyber-physical systems. Throughout his career, he has managed to secure funding by several bodies in the UK (EPSRC, Innovate UK, GCHQ, MoD), the EU (FP6, FP7, H2020), the US (NSF) and Portugal (FCT) with industry support (e.g., BT, Fujitsu, Raytheon, BAE). Dr. Marnerides has published 50+ peer-reviewed papers in prestigious conferences and journals and he is also a patent author. Moreover, he is frequently invited to serve as an expert reviewer for grant proposals for several research councils (e.g., UK EPSRC, Israeli Innovation Authority) as well as for research exercise frameworks (e.g., Hong Kong Research Assessment Exercise – RAE). He holds a PhD in Computer Science from Lancaster University, UK.

Dr. Petros Spachos received his diploma in electronic and computer engineering degree from the Technical University of Crete, Chania, Greece, his MA Sc and Ph.D. degrees in electrical and computer engineering from the University of Toronto, ON, Canada. He is currently an Associate Professor with the School of Engineering, University of Guelph, ON, Canada. His research interests include experimental wireless networking and mobile computing with a focus on wireless sensor networks, smart cities, and the Internet of Things.

Dr. Amit Dvir received the B.Sc., M.Sc., and Ph.D. degrees from Ben-Gurion University, Beer Sheva, Israel, all in communication systems engineering. Dr. Dvir was a Post-Doctoral Fellow with the Laboratory of Cryptography and System Security, Budapest, Hungary. He is currently a Faculty Member in the Computer Science Department and the head of Ariel Cyber Innovation Center, Ariel University, Israel. Dr. Dvir served as a Technical Program Committee (TPC) member as well as a TPC track and workshop co-chair for several top conferences. Dr. Dvir has published 30+ peer-reviewed papers in prestigious conferences and journals. His research interests include enrichment data from encrypted traffic, wireless network and MANET.