



# ECE Distinguished Lecture Series



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University of Sydney, Australia  
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### Provisioning and Resource Management for the Internet of Things

Time: Wednesday, May 2, 2018, 1:00 pm – 2:00 pm

Location: SEH B1220

#### Abstract

Recent technological trends such as Industry 4.0 introduced new challenges that push the limit of current computer and networking architectures. It demands the connection of thousands, if not millions, of sensors and mobile devices coupled with optimized operations to automate various operations inside factories. This led to the new era of Internet of Things (IoTs) where lightweight (possibly mobile) devices are envisaged to send vital information to cloud data centres (mobile and fixed infrastructure) for further processing and decision making.

Current cloud computing systems, however, are not able to efficiently digest and process collected information from IoT devices with strict response requests for two main reasons: (1) the round trip delay between IoT devices to the processing engines of cloud could exceed an application's threshold, and (2) network links to cloud resources could be clogged when IoT devices flush data in an uncoordinated fashion. Fog and Edge Computing are two solutions to address both of the previous problems. Though designed to alleviate the same problem, they have fundamental differences that make adopting one more applicable than the other.

This talk will overview the practical concerns of today's IoT implementations through tackling the most important obstacles that hinder their adoption. First, production of applicable network (fixed and mobile) latency models to capture all elements of IoT platforms. Second, building a holistic platform to orchestrate various inter-related layers of IoT platforms, including connectivity, big-data analytics, and workload optimization. Third, proposing viable solutions that can be actually implemented in IoT-based applications. More details will be provided about the above issues during the talk.

#### Biography

ALBERT Y. ZOMAYA is the Chair Professor of High Performance Computing & Networking and served as Australian Research Council Professorial Fellow (2010-2014) in the School of Information Technologies, Sydney University. He is also the Director of the Centre for Distributed and High Performance Computing which was established in late 2009.

Dr. Zomaya published more than 550 scientific papers and articles and is author, co-author or editor of more than 20 books. He served as the Editor in Chief of the IEEE Transactions on Computers (2011-2014) and currently serves as a Founding Editor in Chief for the IEEE Transactions on Sustainable Computing. Also, Dr. Zomaya serves as a Co-Founding Editor-in-Chief of IET Cyber-Physical Systems and Associate Editor-in-Chief (Special Issues) of the Journal of Parallel and Distributed Computing. He also serves as an associate editor for 22 leading journals, such as, the ACM Computing Surveys, ACM Transactions on Internet Technology, IEEE Transactions on Cloud Computing, and IEEE Transactions on Computational Social Systems. Dr. Zomaya is the Founding Editor of several book series, such as, the Wiley Book Series on Parallel and Distributed Computing, Springer Scalable Computing and Communications, and IET Book Series on Big Data.

Dr. Zomaya has delivered more than 180 keynote addresses and invited seminars, and delivered many media briefings and has been actively involved, in a variety of capacities, in the organization of more than 700 conferences. Dr. Zomaya is the recipient of the IEEE Technical Committee on Parallel Processing Outstanding Service Award (2011), the IEEE Technical Committee on Scalable Computing Medal for Excellence in Scalable Computing (2011), the IEEE Computer Society Technical Achievement Award (2014), and the ACM SIGSIM MSWiM Reginald A. Fessenden Award (2017). He is a Chartered Engineer, a Fellow of AAAS, IEEE, and IET. Dr. Zomaya's research interests are in the areas of parallel, distributed, and mobile computing, networking, and complex systems.