

Computer Science Seminar

Small Data, Big Data, Good Data: Toward Data-Centric and Trustworthy Internet of Things

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Institute for Infocomm Research, Agency for Science, Technology and Research

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10:00 - 10:50 am

209 Computer Science Building

Refreshments will be served at 9:45 am outside CS209

While it has been two decades since its conceptualization, the Internet of Things (IoT) remains a holy grail by and large, with only limited and small-scale deployments in reality. Among the many challenges it faces, two major ones are (1) large-scale data acquisition which cumulates “small data” into “big data” to enable more insightful IoT analytics, and (2) data trustworthiness which ensures “good data” to be consumed by IoT applications. These represent the quantity and quality aspects and underpin a wide range of IoT developments. The first part of this talk introduces Participatory IoT which takes a grassroots approach to large-scale data acquisition, where humans are leveraged as sensors to contribute data. A crucial issue arises there is incentives, i.e., how to motivate large participation with each participant exerting the best effort. I will discuss mechanism design which is an interdisciplinary research field between economics and computer science.

The second part of this talk focuses on data trustworthiness. I will discuss trust and reputation systems and machine learning techniques (e.g., deep learning) for improving data quality in both participatory and orthodox (i.e., conventional sensor-based) IoT contexts. I will also describe some real deployments of my research work.

The talk ends with a number of directions that constitute my future research plans.

Bio: Tony T. Luo is a Program Lead and Research Scientist with the Institute for Infocomm Research (I2R), A*STAR, Singapore. He received the PhD degree in electrical and computer engineering from the National University of Singapore. His research interests are Internet of Things analytics with machine learning, trust management for IoT, and security and privacy. He was a Best Paper Award nominee of IEEE INFOCOM 2015, Best Paper Award recipient of ICTC 2012, and Best Student Paper Award recipient of AAIM 2018. He gave a technical tutorial at IEEE ICC 2016, and his work on mobile crowd-sourcing was featured by the IEEE Spectrum magazine in 2016.

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