

Fall 2015 Seminar Series

DATA-DRIVEN CONTEXT-AWARE WIRELESS NETWORKING

TUESDAY DECEMBER 1, 2015

1:30 PM – HEC 101

Over the past decade we have witnessed the explosive growth of wireless networks. Unlike a traditional wireless device that is basically a radio transceiver, today's smart wireless devices are commonly equipped with powerful application processor, strong multi-modal multi-functional sensors, and high-capacity memory and storage. Accordingly, it becomes possible for a smart wireless device to utilize its powerful sensing and computing capability to enhance networking. Specifically, the device can sense the environment, extract relevant context information from the sensory data, and reconfigure and adapt to the context to achieve better networking performance. In this talk, we will discuss several techniques developed by Dr. Shu and his research group that fulfill the above vision. Considering that spectrum is a fundamental resource for wireless networking, our discussion will emphasize one particular context: the radio environment map (REM). Several statistical learning and stochastic optimization models have been developed to construct REM and use it for better medium access control (MAC) and QoS routing in the 2D (spectrum and time domains) and 3D (space, time, and spectrum domains) settings, respectively. Security and privacy challenges originated from the context computation and utilization will also be discussed.

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Dr. Tao Shu is an assistant professor in the Computer Science and Engineering Department of Oakland University, Rochester, MI. He received his Ph.D. degree in Electrical and Computer Engineering from the University of Arizona in 2010. He also received the Ph.D. degree in Communication and Information Systems from Tsinghua University, Beijing, China in 2003. Prior to joining Oakland University, he worked as a senior engineer in Qualcomm Atheros Inc. in San Jose, CA. His research aims to address security, privacy, and performance issues in data-driven large-scale wireless networking systems, with a strong emphasis on system architecture, protocol design, and performance optimization. He has published over 60 papers in top-tier journals and conferences, such as IEEE/ACM Transactions on Networking, IEEE Transactions on Mobile Computing, IEEE Journal on Selected Areas in Communications, IEEE Transactions on Wireless Communications, ACM MobiCom, ACM MobiHoc, and IEEE INFOCOM.

