

Privacy and Cyber Security in Massive Wireless Networks

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Speaker:

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Abstract:

Billions of wireless devices are foreseen to participate in big data aggregation and smart automation in order to interface the cyber and physical worlds. Such large-scale ultra-dense wireless connectivity is vulnerable to malicious software (malware) epidemics. Malware worms can exploit multi-hop wireless connectivity to stealthily diffuse throughout the wireless network without being noticed to security servers at the core network. Compromised devices can then be used by adversaries to remotely launch cyber attacks that cause large-scale critical physical damage and threaten public safety. This talk will overview the types, threats, and propagation models for malware epidemics in large-scale wireless networks. Then, a novel and cost efficient countermeasure against malware epidemics in large-scale wireless networks, denoted as spatial firewalls, will be discussed. Several design insights for the spatial firewalls will be discussed and future research directions will be highlighted.

Bio:

Dr. Hesham ElSawy is an assistant professor at King Fahd University of Petroleum and Minerals (KFUPM), Saudi Arabia. Prior to that, he was a postdoctoral Fellow at King Abdullah University of Science and Technology (KAUST), Saudi Arabia, a research assistant at TRTech, Winnipeg, MB, Canada, and a telecommunication engineer at the National Telecommunication Institute, Egypt. Dr. ElSawy received his Ph.D. degree in Electrical Engineering from the University of Manitoba, Canada, in 2014. He received several academic and best paper awards including the IEEE COMSOC Best Survey Paper Award and the IEEE ComSoc Outstanding Young Researcher Award for Europe, Middle East, & Africa Region in 2018. His research interests include statistical modeling of wireless networks, stochastic geometry, queueing analysis, and cybersecurity for wireless networks.