THE HONG KONG POLYTECHNIC UNIVERSITY
香港理工大學

Department of Computing
電子計算學系

RESEARCH SEMINAR

Understanding and Mitigating IoT Out-of-Band Vulnerabilities

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Date : 6 Dec 2024 (Fri)
Time : 4:00 pm - 5:00 pm
Venue : FJ303

Abstract

Vulnerabilities have long posed significant challenges to the security of information systems. Historically, these vulnerabilities were primarily associated with functional defects in software and hardware, referred to as in-band vulnerabilities. However, the rapid proliferation of the Internet of Things (IoT) has introduced new security challenges that traditional categorizations fail to fully address. IoT devices, which rely on sensors and actuators to interact with the physical world, have given rise to out-of-band vulnerabilities—defects resulting from unintended interactions between physical and digital systems. In this talk, I will introduce the definition, classification, and exploitation of out-of-band vulnerabilities, providing examples to illustrate their impact. Additionally, I will discuss potential mitigation strategies to secure IoT devices against these vulnerabilities, paving the way for more resilient and secure IoT ecosystems.

About the Speaker

Prof. Xiaoyu JI is currently a Professor in the College of Electrical Engineering at Zhejiang University. He received his B.S. degree in Electrical Engineering from Zhejiang University in 2010 and his PhD degree in Computer Science from the Hong Kong University of Science and Technology (HKUST) in 2015. His research interests include IoT and embedded system security, embodied AI security, and side-channel security, with a particular focus on sensor security. He has published over 30 papers in top-tier venues such as ACM CCS, NDSS, USENIX Security, IEEE S&P, and MobiCom. He has received several awards, including Best Paper Awards at ACM CCS 2017 and ACM AsiaCCS 2018, as well as a number of industry ones. He has served on the Technical Program Committees of ACM CCS, NDSS, USENIX Security, WWW, and is an Area Associate Editor for the Internet of Things Journal. His research has been featured in media outlets such as MIT Technology Review and BBC News.

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