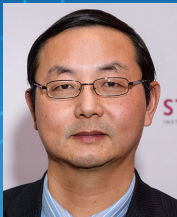


RESEARCH SEMINAR

IoT-Mediator - Detecting and Handling IoT Interaction Threats in Multi-Platform Multi-Control-Channel Smart Homes



Prof. James Xiaojiang Du

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Date : 19 March 2024 (Tue)
Time : 4:00 pm - 5:00 pm
Venue : HJ303

Abstract

A smart home involves a variety of entities, such as IoT devices, automation applications, humans, voice assistants, and companion apps. These entities interact in the same physical environment, which can yield undesirable and even hazardous results, called IoT interaction threats. Existing work on interaction threats is limited to considering automation apps, ignoring other IoT control channels, such as voice commands, companion apps, and physical operations. Second, it becomes increasingly common that a smart home utilizes multiple IoT platforms, each of which has a partial view of device states and may issue conflicting commands. Third, compared to detecting interaction threats, their handling is much less studied. Prior work uses generic handling policies, which are unlikely to fit all homes. We present IoT-Mediator, which provides accurate threat detection and threat-tailored handling in multiplatform multi-control-channel homes. Our evaluation in two real-world homes demonstrates that IoT-Mediator significantly outperforms prior state-of-the-artwork. This work has been published at one of the top four security conferences - USENIX Security 2023.

About the Speaker

Prof. James Xiaojiang Du is the Anson Wood Burchard Endowed-Chair Professor in the Department of Electrical and Computer Engineering at Stevens Institute of Technology, USA. He has authored over 500 journal and conference papers in these areas, including the top security conferences such as IEEE Security & Privacy (S&P / Oakland), USENIX Security, and NDSS. Prof. Du has been awarded more than 8 million US dollars research grants from the United States National Science Foundation (NSF), US National Security Agency (NSA), US Army Research Office, US Air Force Research Lab, the State of Pennsylvania, and Amazon. He won the best paper award at IEEE ICC 2020, IEEE GLOBECOM 2014 and the best poster runner-up award at the ACM MobiHoc 2014. He serves on the editorial boards of three IEEE journals. He was the chair of multiple IEEE/ACM conferences, including General Co-Chair of IEEE/ACM IWQoS 2023, General Co-Chair of EAI SecureComm 2023, TPC Chair of IEEE CloudNet 2023, and Lead Chair of the Communication and Information Systems Security Symposium of IEEE Globecom 2023. Prof. Du is an IEEE Communications Society Distinguished Lecturer 2023-2024. He is an IEEE Fellow, an ACM Distinguished Member, and an ACM Life Member.