

Title: Techniques for Enhanced Vulnerability Management for the Industrial Internet of Things

Speaker: Dr. Geeta Yadav (Cybersecurity Researcher, Hitachi)

Date and Time: 24th July, 2023, 11 AM

Abstract:

The modernization of the SCADA industrial control system, standardization of communication protocols, and almost ubiquitous interconnectivity courtesy for IIoT have drastically increased the attack surface of the IIoT-based SCADA system. Systematic vulnerability management of these attack surfaces minimizes risk and impact associated with vulnerability exploitation. In this talk, I will share an overview of my research on effective vulnerability management techniques for IIoT-based SCADA, particularly vulnerability prioritization. We have developed and designed a three-level security solution for Multi-host Multi-stage (MhMs) possible attack discovery, including a detailed vulnerability analysis for SCADA with the help of various datasets. To address the challenges in prioritizing patches in industrial control systems, we proposed SmartPatch, a three-step systematic method to serialize patches of vulnerabilities in an interdependent and complex network validated by a case study of an interdependent, complex SCADA chain in the smart grid system using the IEEE 5-Bus system. We proposed GloM: Global Monitor using SpatioTemporally Correlated Local Monitors leveraging attack graphs & deep learning-based algorithms to flag ongoing MhMs possible vulnerability exploitations with high accuracy and low network overhead.

Speaker Bio:

Dr. Geeta is a cybersecurity researcher at Hitachi India Pvt. Ltd. (R&D). Her research interests are Vulnerability management, SCADA system security, patch management, and IIoT Security. She has worked as a post-doctoral research fellow at C3i Hub, IIT Kanpur under the guidance of Prof. Sandeep Kumar Shukla. She has completed her Ph.D. from Amar Nath & Shashi Khosla School of Information Technology, IIT Delhi under the supervision of Prof. Kolin Paul. Before joining IITD, she worked as an R&D Engineer at Samsung, India, and Samsung, Korea. She received her B.Tech in Computer Engineering from NIT Jaipur.