PSERC Power Systems Engineering Research Center

PSERC WEBINAR

Cybersecurity for DER Networks: Situational Awareness and Attack Surface Reduction

Manimaran Govindarasu
Iowa State University

The power grid has been undergoing major transformation with the increasing integration of Distributed Energy Resources (DERs), including solar and wind sources, energy storage, and microgrid technologies. These DER networks are increasingly relied on advanced sensors, edge computing, wide area communication, cloud infrastructures, and ML-based analytics – in the form of Industrial Internet of Things (IIoT) – for real-time monitoring and control applications. Secure and resilient operation of these IIoT networks is of paramount importance to the secure and reliable operation of the DER-integrated smart grid. In this talk, we first present cybersecurity issues and challenges for DER networks. Then, present two case studies of our research in cybersecurity for DER networks, namely, (i) a 2-tier architecture and ML-based algorithms for cybersecurity situational awareness, and (ii) a Moving Target Defense (MTD)-based technique for attack surface reduction. We finally conclude the talk with some directions future research. The research presented this talk is funded in part by the DOE SETO program.

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LINK TO WEBINAR

(10:00-11:00 P.M. PDT)

Manimaran Govindarasu holds the titles of Anson Marston Distinguished Professor in Engineering and Harpole Professor in Electrical and Computer Engineering at Iowa State University (ISU). His research experience includes CPS security for the smart grid, Internet security, and real-time systems. He has co-authored nearly 250 peer-reviewed research publications, received multiple best paper awards, presented several dozen invited talks, tutorials, and industry short-courses/hands-on training on cybersecurity. He has served as an Associate Editor for IEEE Transactions on Smart Grid and IEEE Transactions of Mobile Computing and serving as the Chair of the Cybersecurity Working Group in IEEE PES. He led the effort to build ISU's CPS security testbed for smart grid and successfully collaborated with many universities, national laboratories, and industries in R&D projects. His research program received funding from NSF, DOE, DHS, DoD, PSERC, and ISU EPRC. He is a Fellow of the IEEE.