

# DIGITAL TWINS A NEW FRONTIER IN CRITICAL INFRASTRUCTURE PROTECTION

THURSDAY: SESSION 4, TRACK 2

## SESSION CHAIR

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## SPEAKERS

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- John Sobanjo, Florida State University
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## SESSION ABSTRACT

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A digital twin is a computational model (or set of coupled) that evolves over time to persistently represent the critical structure, its components, system or process. Digital twin underpins intelligent automation by supporting data-driven decision making and enabling asset specific analysis and system behavior. Within the contexts of critical Infrastructure Systems, the digital twins represent the flow of information among connected platforms and it does become the central clearinghouse for data and visualization. In the future as many agencies converts to digital twin capabilities, agencies have to migrate towards continuous real-time performance models and calibrate by pairing data from real-time sensors, meters, weather and other data. The digital twin can be used to run “what-if” scenarios, predict and prevent failures, provide early alerts of anomalies and conduct predictive analysis. The strength of digital twin is the interconnectivity of data and models. Hence any model can use any combination of inputs (e.g. operator owned data sets and sensors, third party data bases or weather data, threat modeling or risk modeling. This creates a platform whereby one model may become the input to another. Depending on the intrinsic characteristics of the system, these actions can be made automatically or manually. The main characteristic of the digital twin: a) trustworthy and accurate digital representation of the critical infrastructure systems; b) feedback loops that can enable near real-time data transfer between the virtual replicate and critical infrastructure systems; c) Common data environment; d) Analytic, including machine learning, simulation which can provide predictive future “what- if” situations.

Topics of Focus:



- Digital Twins and Cyber Resilience
- Developing more Realistic Predictive Maintenance Models
- Data driven Critical Infrastructure Monitoring
- Graphical Models and Digital Twins
- Case Studies