

IEEE  
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## IEEE DTPI Special Session (by invitation only):

### Smart City Digital Twins (SCDT) Convergence Workshop II

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Organized by the IEEE DTPI 2022

Cities around the world are increasingly integrating socio-technical advancements to transform their urban systems toward smart cities. As the world continues to urbanize, convergent science, engineering and policy for urban systems is needed to ensure such transformative developments are, in fact, creating sustainable urban systems that benefit the citizens and societies at large. This requires both: (1) convergence of a variety of involved academic disciplines and practitioner expertise from city stakeholders; and (2) convergence of cyber-enabled technology systems at the human-infrastructure interface, creating a new system that can be referred to as a Smart City Digital Twin. With a vision of advancing understanding, development, and application of Smart City Digital Twins, this Smart City Digital Twin Convergence Conference aims to bring together experts from academia, industry, municipalities, and nonprofit organizations from large metropolitan areas in the United States to develop a convergent socio-technological framework for delivering smarter services through Smart City Digital Twins. The proposed Convergence Conference on Smart City Digital Twins also intends to create a community of thought leaders in this emerging area of inquiry.

### Important Dates:

**September 18, 2022**

Extended Abstract Submission

**October 4, 2022**

Camera-Ready Uploads

**October 26, 2022**

SCDT Convergence Workshop II

### Journal Fast-tracking Opportunity

Selected submissions from this Special Session will be invited to direct publication in the *IEEE Journal on RFID Special Issue on "Digital Twins and Parallel Intelligence (DTPI 2022)."*

- Theories, Models, and System Architecture for Smart Buildings, Smart Communities, and Smart City Digital Twins.
- Scaling Digital Twins from single infrastructure systems to multiple interdependent systems.
- Data, Sensing modalities, IoT, and Analytics for Smart Buildings, Smart Communities, and Smart City Digital Twins.
- Human-Infrastructure Interdependencies, Connectivity, and Community Engagement.
- Information Modeling, Management, and Decision Support for Digital Twins.
- Digital Twin virtualization (Virtual Reality / Augmented Reality / Mixed Reality).
- Implications for Operational Readiness, Context-Aware Simulation, and Crisis Management.

This convergence conference will explore basic research occurring at the intersection of infrastructure systems, human systems, and technology systems. Smart City Digital Twins represent a new critical infrastructure transforming city operations and management. Existing knowledge on the requirements for single infrastructure Smart City Digital Twins will be shared as emerging testbeds in the areas of energy, built environment, water, and transportation are under development at Georgia Tech, Stanford University, Columbia University and the University of Illinois (Chicago). This sharing of knowledge will provide fundamental insights on multi-infrastructure interdependencies, as well as how human-infrastructure interactions can be sensed, analyzed, controlled, and visualized using cyber-infrastructure enabled technology such as Internet of Things (IoT). New knowledge will be created by engagement of interdisciplinary academic experts, industry practitioners, and government officials in workshop-style facilitated discussions to (1) develop a framework for comparing Smart City Digital Twin efforts and their stages of evolution and (2) chart a roadmap for future Smart City Digital Twin efforts that advance urban sustainability, resilience, and social well-being. Taken together, these convergence conference activities will provide a critical coalescing force as the new discipline of Smart City Digital Twins emerges. Smart City Digital Twinning efforts have the potential to transform the livability, sustainability, and resilience of cities, creating new business opportunities for companies of all sizes, new forms of citizen engagement by communities, creative forms of pedagogical practices, and new approaches to city operations and management by governments.

### Special Session Chairs

**Patricia Culligan,**  
University of Notre Dame

**Sybil Derrible,**  
University of Illinois at Chicago

**Rishee Jain,**  
Stanford University

**Debra Lam,**  
Georgia Institute of Technology

**Neda Madi,**  
Georgia Institute of Technology

**John E. Taylor,**  
Georgia Institute of Technology