Critical Infrastructure Protection & Recovery Working Group (CIPR WG)

# International Call & Presentation – 13 May 2021

**The INCOSE CIPR working group invites you to participate in our monthly webinar.
13 May 2021, 3:00 PM Eastern / 12:00 PM Pacific (Call-in Information Below)**

Speaker: Dr. Matt Bartos, UT Austin

Matt Bartos is an Assistant Professor in the Department of Civil, Architectural, and Environmental Engineering at the University of Texas at Austin. He holds a Ph.D. in Civil Engineering (2020), and an M.S. in Electrical and Computer Engineering (2019) from the University of Michigan. He also holds a B.S.E. in Environmental Engineering (2013), and a B.A. in English Literature (2013) from Arizona State University. Matt's research focuses on intelligent and adaptive water infrastructure—a field that combines hydraulics, embedded electronics, signal processing, and control theory. Major areas of interest include urban flood mitigation, low-cost water quality monitoring, real-time control of hydraulic infrastructure, and coupled infrastructure systems modeling.

Presentation: Can digital twins make our stormwater systems more resilient?

Cities face unprecedented water-related challenges due to rapid urbanization, aging infrastructure, and more frequent extreme weather events. *Smart stormwater systems* offer a new approach for addressing urban water challenges by enabling infrastructure to adapt in real-time to meet operational goals and mitigate adverse impacts. In a future characterized by these systems, networks of sensors will detect and communicate flood events at the neighborhood scale to improve disaster response. Meanwhile, wirelessly controlled valves, gates and pumps will coordinate water releases across cities to mitigate combined sewer overflows and improve water quality. While these technologies promise to transform the field of water resources management, considerable knowledge gaps remain with regards to how smart water systems should be designed and operated.
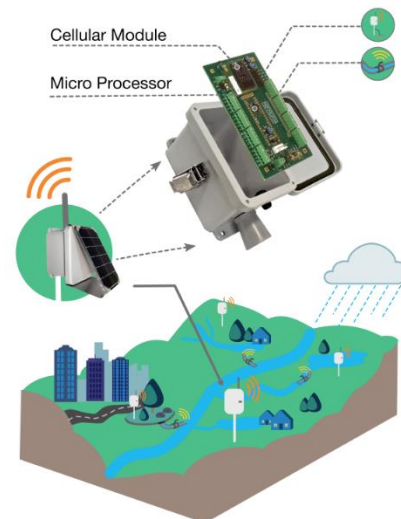
In this talk, I will present foundational work towards building the smart stormwater systems of the future. Specifically, I will showcase a new *digital twin* proof-of-concept that combines (i) a first-of-its-kind embedded platform for real-time sensing and control of urban drainage systems, and (ii) new software for hydrologic state estimation that will enable real-time geolocation of floods and water quality hazards. Drawing on this work, I will highlight some of the major challenges and opportunities that lie ahead for digital twins and hydraulic infrastructure.

Call-in Information: Zoom for Government: https://nps-edu.zoomgov.com/j/1604876250
Meeting ID: 160 487 6250
Meeting Password: inc$3eCIPR (via app); 4806421598 (via phone)
One tap mobile (US San Jose): +16692545252,,1604876250#,,,,,,0#,, 4806421598#
One tap mobile (US New York): +16468287666,,1604876250#,,,,,,0#,, 4806421598#
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