Critical Infrastructure Protection & Recovery Working Group (CIPR WG)

International Call & Presentation – 11 March 2021

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

Speakers: Mark Austin and Maria Coelho, University of Maryland

Mark Austin is an Associate Professor in the Department of Civil and Environmental Engineering. He has affiliate appointments with the Institute for Systems Research (ISR) and Interdisciplinary Program of Applied Mathematics. His research interests lie at the intersection of Civil Systems, Computer Science, and Model-based Systems Engineering. He has ongoing research collaborations with the Building Energy Group at NIST, the Neuro-Oncology Group at NCI (National Cancer Institute) in Bethesda, MD, and the SERC (Systems Engineering Research Center). From 2010-2015 he served as Technical Director of the Master of Science in Systems Engineering (MSSE) Program at ISR. He is a member of the IEEE Cyber-Physical Systems Working Group. His undergraduate and graduate degrees in Civil Engineering are from the University of Canterbury (New Zealand) and U.C. Berkeley, respectively. Email: austin@umd.edu

Maria Coelho is a fourth-year Ph.D. student in the Civil Systems Program offered by the Department of Civil and Environmental Engineering at the University of Maryland, College Park. Her research aims to enhance decision making in urban settings by integrating artificial intelligence technologies with distributed behavior modeling. Most recently, she has been exploring opportunities for combining machine learning formalisms and semantic model representations of urban systems, that work side-by-side in collecting data, identifying events, and managing city operations in real-time. Email: mecoelho@terpmail.umd.edu

Abstract: Architecting Smart City Digital Twins for Infrastructure Protection and Recovery

Abstract. Our work is motivated by the premise that next-generation smart city systems will be enabled by widespread adoption of sensing and communication technologies deeply embedded within the physical urban domain. These technological advances (e.g., sensing, processing, and data transmission) are what makes smart city digital twins possible. This presentation will explore the challenge of architecting smart city digital twins for infrastructure protection and planning of recovery actions. A smart city digital twin architecture is proposed that supports semantic knowledge representation and reasoning, working side by side with machine learning formalisms, to provide complementary and supportive roles in the collection and processing of data, identification of events, and automated decision-making. These capabilities will play a pivotal role in infrastructure protection and recovery. Case studies will include: (1) Distributed systems behavior modeling with ontologies and rules, (2) Detection and diagnostic analysis of faults in HVAC equipment in buildings, (3) Energy consumption of 2,500 buildings in Chicago, and (4) Semantics + data mining for Precision Medicine.

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#
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