

## **Smart Data Analytics for Sustainable Buildings and Infrastructure Systems**

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### ***Abstract***

In its report on the fundamental challenges in moving toward infrastructure systems that are physically, socially, economically, and environmentally sustainable, the National Research Council calls for “a paradigm shift in how the nation thinks about, builds, operates, and invests in critical infrastructure systems” – a paradigm that uses advanced analytics and intelligent automated processes, focuses attention on the value to the people, and brings more information and stakeholders to the table. This raises fundamental research questions: How to support intelligent and automated analytics and processes for more sustainable and efficient design, construction, operation, and maintenance of buildings and infrastructure systems? How to plan, design, and operate our infrastructure in a more human-centered manner towards better synergy between human values and the built environment? How to extract actionable information/knowledge from the large, distributed, and heterogeneous data that exist for understanding the contributing factors to infrastructure deterioration and for selecting and prioritizing the operations necessary to maintain the reliability of the infrastructure system? This seminar will discuss recent research efforts that aim to address these societal challenges and research questions.

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Nora El-Gohary is an Associate Professor in the Department of Civil and Environmental Engineering at the University of Illinois at Urbana-Champaign. Dr. El-Gohary’s research focuses on smart data analytics for the development and operation of sustainable buildings and infrastructure systems, including information modeling, information extraction, data fusion, machine learning, and big data analytics. Her research has been funded by NSF, IDOT, ICT, Qatar Foundation, and the Natural Sciences and Engineering Research Council (NSERC) of Canada among other funding agencies. The outcomes of her research has been published in over 100 journal and conference publications. She has received several research awards including the NSERC’s Discovery Award in 2009, the NSF’s CAREER Award in 2013, the CAS Award in 2015, and the NCSA Award in 2018. Dr. El-Gohary currently serves as the Past Chair of the ASCE’s Data Sensing and Analysis Committee, the Co-Chair of the TRB’s Information Systems in Construction Management Subcommittee, and the Secretary of the Executive Committee of the ASCE’s Computing Division. She also currently serves as Associate Editor for the ASCE Journal of Computing in Civil Engineering.

