

October 3, 2025

Digital Twins and AI Towards Autonomy of the Built Environment

ABSTRACT: The last decade has been truly transformational with many technological advancements, such as Internet-of-Things, Industry 4.0, Artificial Intelligence and Automation. Given the unique context of built environment, Civil and Environmental Engineers can lead in developing effective approaches that combine domain models with these technological advancements to address the world's biggest challenges, such as the ones identified in UN's Sustainability Goals, in a more holistic and transformational way. This presentation will provide specific research examples that highlight Carnegie Mellon's interdisciplinary research approaches in developing digital twins coupled with AI in enabling proactive operations and management of facilities and infrastructure systems. It will also highlight the significance of such an approach towards achieving self-aware autonomous facilities and infrastructure systems.



Burcu H. Akinci

*Professor and
Chairman, Carnegie
Mellon University*

Seminar Details

*Friday, Oct 3, 2025
2:30pm – 4:00pm*

*UH Campus
Classroom & Business
Building
Room CBB 104*

*Online via Teams [https://
www.cive.uh.edu/
research/beyer-
distinguished-lecture](https://www.cive.uh.edu/research/beyer-distinguished-lecture)*

BIOGRAPHY: Dr. Burcu Akinci is Hamerschlag University Professor and department head of Civil & Environmental Engineering at Carnegie Mellon University. She is also a member of the National Academies of Construction, Distinguished Member in ASCE, and AAAS Fellow. She earned a bachelor's degree in civil engineering from the Middle East Technical University (Ankara, Turkey), MBA from Bilkent University (Ankara, Turkey), and master's and PhD degrees in civil and environmental engineering from Stanford University.

Dr. Akinci's research interests include modeling and reasoning about digital twins of buildings and infrastructure systems to streamline construction and infrastructure operations and energy efficiency. She and her team specifically focus on investigating utilization and integration of building information models with data capture technologies, such as 3D imaging and other sensors, and develop AI based approaches to support proactive and predictive operations and management, and to enable autonomy in the built environment.

Dr. Akinci is the recipient of the ASCE Peurifoy Award in 2023, the IAARC Tucker-Hasegawa Award in 2021, the ASCE Computing in Civil Engineering award in 2020, Professor of the year award in 2011 from the ASCE Pittsburgh section, the CETI Outstanding Early Career Researcher award from the FIATECH in 2008 and the ASCE Walter L. Huber Civil Engineering Research Prize in 2007. She has best paper awards from the Journal of Computing in Civil Engineering in 2002, and from the Construction Research Congress, ISARC and ICCCBCE in 2009, 2011 and 2014, respectively.

Dr. Akinci has two patents, and one provisional patent and over 80 refereed journal publications and 110 conference publications. She has given over 100 invited presentations and keynotes, and co-edited books on CAD/GIS Integration and on Embedded Commissioning. She co-founded and is the Chief Innovation Officer at the LeanFM Technologies, which received the 2017 Pittsburgh Business Times Innovation Award. She also serves on the National Academies Board on Infrastructure and the Constructed Environment.