

AI-BASED DIGITAL TWINNING THE BUILT ENVIRONMENT

Speaker

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Abstract

Digital Twinning methods can produce a reliable digital record of the built environment and enable owners to reliably protect, monitor and maintain the condition of their asset. The built environment is comprised of large assets that need significant resource investments to design, construct, maintain and operate them. Improving productivity, i.e., efficiency and effectiveness, and creating new, disruptive ways to address existing problems throughout their lifecycle can generate significant performance improvements in cost, time, quality, safety, sustainability, and resilience metrics for all involved parties. Creating and maintaining an up-to-date electronic record of built environment assets in the form of rich Digital Twins can help generate such improvements. This talk introduces research conducted at the University of Cambridge on inexpensive AI methods for generating object-oriented infrastructure geometry, detecting, and mapping visible defects on the resulting Digital Twin, automatically extracting defect spatial measurements, and sensor and sensor data modelling. The results of these methods are further exploited through their application in design for manufacturing and assembly (DfMA), mixed-reality-enabled mobile inspection, and proactive asset protection from accidental damage.

Biography

Prof Ioannis Brilakis is the Laing O'Rourke Professor of Civil & Information Engineering and the Director of the Construction Information Technology Laboratory at the Division of Civil Engineering of the Department of Engineering at the University of Cambridge. He completed his PhD in Civil Engineering at the University of Illinois, Urbana Champaign in 2005. He then worked as an Assistant Professor at the Departments of Civil and Environmental Engineering, University of Michigan, Ann Arbor (2005-2008) and Georgia Institute of Technology, Atlanta (2008-2012) before moving to Cambridge in 2012 as a Laing O'Rourke Lecturer. He was promoted to Reader in October 2017 and to Professor in 2021. He has also held visiting posts at the Department of Computer Science, Stanford University as a Visiting Associate Professor of Computer Vision (2014) and at the Technical University of Munich as a Visiting Professor, Leverhulme International Fellow (2018-2019), and Hans Fischer Senior Fellow (2019-2023). He is a recipient of the 2022 EC3 Scherer Award, 2022 EC3 Thorpe Medal, 2019 ASCE J. James R. Croes Medal, the 2018 ASCE John O. Bickel Award, the 2013 ASCE Collingwood Prize, the 2012 Georgia Tech Outreach Award, a 2010 NSF CAREER award, and a 2009 ASCE Associate Editor Award. Dr Brilakis is an author of over 200 papers in peer-reviewed journals and conference proceedings, an Associate Editor of the ASCE Computing in Civil Engineering, ASCE Construction Engineering and Management, Elsevier Automation in Construction, and Elsevier Advanced Engineering Informatics Journals, and the lead founder of the European Council on Computing in Construction.



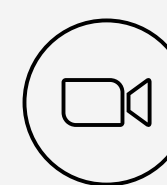
8 August 2024
Thursday



10:30 am - 12:00 pm



Civil Engineering
Conference Room
Room 3574 (Lift 27/28)



Zoom Link
Meeting ID: 960 3441 8724
Passcode: 515940

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