



A.D. 1308

unipg

DIPARTIMENTO
DI INGEGNERIA
CIVILE E AMBIENTALE

International Doctoral Program in Civil and Environmental Engineering

SEMINAR

3D Printing for Smart Constructions

Prof. Simon LAFLAMME

Dept. Civil, Construction and Environmental Engineering,
Iowa State University,
USA

[Scan or click here
to join!](#)



Location:

UNIPG Campus of Engineering
Via G. Duranti, 93, Perugia
Room 16

Timetable:

October 17th 2024 - 12:00 p.m. (CET)

Abstract

Advances in manufacturing have led to unmatched capabilities in construction speed, materials usage, and geometric flexibilities. This is especially true for 3D printing technologies, which hold the potential to improve the sustainability and resilience of civil infrastructure. Although 3D printing has been successfully demonstrated at large scales, such as in building concrete houses and a steel pedestrian bridge, the technology is yet to be widely accepted by the civil engineering community. In this talk, we review challenges impeding the acceptability of the technology, including the individuality of components that can introduce unacceptable levels of uncertainty, and discuss solutions that could empower field deployment of the technology. One of these solutions is the integration of structural health monitoring (SHM) systems. SHM can provide real-time condition assessments of 3D-printed parts, ensuring that they perform as designed and thus guaranteeing structural integrity during operation. The integration of SHM with data-driven algorithms, automation, and advanced manufacturing techniques has the great potential to improve sustainability and resilience to produce smart constructions.



Simon Laflamme is the Waldo. W. Wegner Professor in Civil Engineering and the Director of Research in the Department of Civil, Construction, and Environmental Engineering at Iowa State University, and holds a Courtesy Appointment in the Department of Electrical and Computer Engineering. He received his Ph.D in Structures and Materials from the Massachusetts Institute of Technology in 2011, and was granted the Early Achievement in Research Award (2017) and the Mid-Career Achievement in Research Award (2022) by Iowa State University, and is a Fellow of the Institute of Physics. Dr. Laflamme's research yielded a textbook on Structural Motion Engineering, five U.S. patents, and more than 250 articles in the areas of Smart Structures and Systems, Structural Control, and Structural Health Monitoring. He is a member of various editorial boards including Mechanical Systems and Signal Processing, Measurement Science and Technology, and Sensors.

For more info Mrs. Teresa Nocera, Ph.D. Program Secretariat (teresa.nocera@unipg.it)
Prof. Dr. Filippo Ubertini, Ph.D. Program Coordinator (filippo.ubertini@unipg.it)

