PhD Programs in
Theoretical and Applied Mechanics & Structural and Geotechnical Engineering
@ Sapienza - Università di Roma

Alessandro Lucantonio

AI-based Learning for Physical Simulation

Martedì 19 luglio, ore 16:00-17:00

Biblioteca – Sala Ingegneria Geotecnica (III piano del Chiostro)
ZOOM link: https://uniroma1.zoom.us/j/85146803576

Abstract

Computational physical modeling is a key resource to complement theoretical and experimental methods in modern scientific research and engineering. While access to large amount of data has favored the use of Artificial Intelligence and Machine Learning (ML) techniques to enhance physical simulations, limitations of purely data-driven methods have emerged as concerns their generalization capability and their intelligibility.
To overcome these limitations, I propose a hybrid approach that originally combines ML methods and equation-based modeling to significantly improve generalization in small-data scenarios, while guaranteeing the intelligibility of the physical models through the use of symbolic representations. To efficiently handle the computational cost associated with the proposed methods, I will implement them in a new software platform that seamlesslyintegrates automated model learning and high-performance simulation.
Thanks to their general-purpose nature, the methods and algorithms developed in this project may be employed in all scientific disciplines and in engineering workflows. In particular, I plan to use them to advance biology and soft robotics by solving challenging modeling tasks.

Short BIO

Alessandro Lucantonio is associate professor of Solid and Structural Mechanics at the BioRobotics Institute of Scuola Sant'Anna (Pisa). He obtained his BS in Aerospace Engineering (2008), MS in Space Engineering (2010) and PhD in Theoretical and Applied Mechanics (2013) at Sapienza Università di Roma. He started his career at SISSA (Trieste) as assistant professor and moved to Scuola Sant'Anna in 2018 as assistant professor with tenure track.

His research interests focus the mechanics and geometry of soft active materials, continuum mechanics and computational physics.

He was recently awarded the *ERC Starting Grant 2021* the project "AI-based Learning for Physical Simulation (ALPS)".

Per informazioni sull'evento contattare Paola.nardinocchi@uniroma1.it o visitare la pagina web del DISG http://www.disg.uniroma1.it/