UME Seminar

Multi-material constitutive learning in hyperelasticity

Dr. Clément Jailin
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Date and Time: 11th of May (2:30 – 3:30 pm)
Venue: Amphi 104 - Pôle Mécanique

Abstract

Physics-Augmented Neural Networks (PANNs) have recently emerged as a promising approach for constitutive learning, combining the expressivity of neural networks with thermodynamic constraints. While most developments have so far remained within a numerical setting, this presentation will address their transfer to experimental learning.
The talk will focus on the learning of a multi-material model for hyperelastic behaviors from a database of more than 30 experiments performed on different materials and monitored by DIC and DVC. By gathering these experiments within a common learning framework, it becomes possible to build a reduced parametric model in which the structure of the constitutive energy modes is learned entirely from the data. This approach makes it possible to gather information across experiments, share complexity across materials, and move toward a laboratory-scale shared constitutive representation.

About the speaker

Clément Jailin is a CNRS researcher (CPJ) at the Laboratoire de Mécanique Paris-Saclay (LMPS), at ENS-Paris-Saclay. His research focuses on experimental mechanics, full-field measurements, and data-driven approaches for constitutive modeling. He works in particular on the identification and learning of material behaviors from imaging data, combining digital image and volume correlation (DIC/DVC), tomography, and physics-informed machine learning.

Seminar webpage link