LMS Seminar

Operator learning in mechanics and materials

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Date and Time: October 09, 2025 (2 – 3 pm)

Venue: Amphi 104 (Pole Meca)

Abstract

Mechanics and materials are gradually becoming data-rich due to rapid advances in experimental science and high-performance multiscale computing. There has been a growing interest in the field of solid mechanics for developing data-driven and learning-based methods to characterize, understand, model, and design material/structural systems. With data-driven approaches, it is possible to remove/relax the need for ad hoc constitutive models for describing the material behavior, to achieve fast multi-scale computation for structures as well as to generate optimal designs. This talk will survey operator-learning methods developed for mechanics and materials, including (i) data-driven surrogate models for classes of PDEs, (ii) discovery of constitutive relations for materials with complex, history-dependent behavior, and (iii) hybrid computational frameworks that couple learning with physics for complex geometries.

About the speaker

Burigede Liu is the Granta Design Assistant Professor at the University of Cambridge. He received his Ph.D. in Engineering at University of Cambridge in 2019. He was a postdoc in Department of Mechanical and Process Engineering at ETH Zurich (2019) and a postdoctoral fellow in Mechanical and Civil Engineering at California Institute of Technology (2019-2021). Prof Liu's research interest includes data-driven mechanics; uncertainty quantification of materials; micro-mechanics of metals, composites and mechanical meta-materials as well as quantum computing.

Google calendar link ▪ Seminar webpage link