

Séminaire du laboratoire PIMM

Jeudi 13 janvier 2022 à 13h30 en Amphi A

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présentera dans le cadre du séminaire ses travaux intitulés :

Machine learning and Deep learning application to material science modelling and characterization

The advent of artificial intelligence in material science community is less than a decade old. The recent advances in the computational power combined with the efficient algorithms have enabled machine learning to be successfully applied in many field. Recently, data driven mechanics and neural network assisted models have found its application in material science owing to the efficiency and accuracy to model materials behaviour in the absence of constitutive law or in complex constraints. Some of which are prediction of elastic properties of 3D complex braided composites, prediction of rate dependent plasticity models, quantifying fracture surfaces, 3D segmentation and characterization of complex materials, crystal symmetry determination, EBSD reconstruction, phase detection, quantification of damage and microstructure optimization and design. In this talk I will present some of my work on material characterization by “artificial intelligence” and is structured as below.

1/ First half is dedicated to Machine learning (in particular Bayesian technique) with application to single crystal elastic constant determination in Ti (α/β) alloy with high energy X-Ray diffraction and on identification and quantification of material parameters of viscoplastic model (case study of magnesium).

2/ Second half will be on neural network and its application to EBSD based martensite characterization in steels and a simple feed-forward neural network based micro-Laue indexation of complex and low symmetry Laue patterns.

