

JOINT SEMINAR

DOMAIN KNOWLEDGE-GUIDED MACHINE LEARNING

Speaker

Prof. Tong-Yi Zhang

Hong Kong University of Science and Technology (Guangzhou)

Abstract

This presentation first briefly introduces the concept of materials/mechanics informatics. Materials/mechanics informatics is growing extremely fast by integrating machine learning with materials/mechanics science and engineering, where techniques, tools, and theories drawn from the emerging fields such as data science, internet, computer science and engineering, and digital technologies, are applied to the materials/mechanics science and engineering to accelerate materials/mechanics, products and manufacturing innovations.

Then, this presentation reports a domain knowledge-guided machine learning strategy and demonstrate it by studying the oxidation behaviours of ferritic-martensitic steels in supercritical water. This strategy leads to the development of a formula with high generalization and accurate prediction power, which is most desirable to science, technology, and engineering.

Biography

Prof. Tong-Yi Zhang is the founding Dean of Materials Genome Institute, Shanghai University, and the founding Director of the Materials Genome Engineering Division in the Chinese Materials Research Society (CMRS). He joined the Hong Kong University of Science and Technology (Guangzhou) in 2022. He is the founding Editor-in-Chief of Journal of Materials Informatics. He received numerous awards including the 2018 Prize for Scientific and Technological Progress from the HLHL Foundation, the Second Prizes of 2007 and 1987 State Natural Science Award, China, and the 1988 National Award for Young Scientists, China. He became Fellow of International Congress on Fracture in 2013, Fellow of the Hong Kong Academy of Engineering Sciences in 2012, Member of Chinese Academy of Sciences in 2011, Senior Research Fellow of Croucher Foundation, Hong Kong, in 2003, Fellow of ASM International, USA, in 2001. His current research interests are Materials Genome Engineering and Materials/Mechanics Informatics.



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Room 1103 (Lift 19)
HKUST

Enquiry:

Ms. Rebecca Yau
cerebeca@ust.hk