



MATH-IMS Joint Applied Mathematics Colloquium Series The Chinese University of Hong Kong

This MATH-IMS Joint Colloquium Series is organized by Center for Mathematical Artificial Intelligence (CMAI), under Department of Mathematics and Institute of Mathematical Sciences (IMS) at The Chinese University of Hong Kong. The colloquium series focuses on mathematics and applications of artificial intelligence, big data and related topics.

Date: October 16, 2020 (Friday)

Time: 10am – 11am (Hong Kong Time)

Zoom Link: <https://cuhk.zoom.us/j/92775210812>

Machine Learning and Computational Mathematics

*Speaker: : Professor Weinan E
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Abstract: The heart of machine learning is the approximation of functions using finite pieces of data. This is one of the main pillars of computational mathematics. Thus it is not surprising that the success of machine learning in dealing with functions in very high dimensions has opened up some brand new territories in computational mathematics, with potentially unprecedented impact for years to come. In the first part of this talk, I will review some of the most exciting advances of using machine learning to address problems in scientific computing and computational science. In the second part of this talk, I will discuss how machine learning can be formulated as a problem in computational mathematics and how ideas from numerical analysis can be used to understand machine learning as well as construct new machine learning models and algorithms.

Bio: Professor Weinan E obtained his BS degree from the University of Science and Technology of China in 1982 and his master's degree in Academy of Mathematics and Systems Science at Chinese Academy of Sciences in 1985. He obtained his PhD from the University of California at Los Angeles in 1989 under the supervision of Professor Bjorn Engquist. He is currently a professor in the Department of Mathematics and Program in Applied and Computational Mathematics at Princeton University. Professor E has made tremendous contributions to homogenization theory, theoretical models of turbulence, stochastic partial differential equations, electronic structure analysis, multiscale methods, computational fluid dynamics, and weak KAM theory. He has won numerous awards, including the Presidential Early Career Award in Science and Engineering in 1996, Feng Kang Prize in Scientific Computing in 1999, ICIAM Collatz Prize in 2003, Ralph E. Kleinman Prize in 2009, Theodore von Kármán Prize in 2014 and Peter Henrici Prize in 2019. He was elected as a fellow of the Institute of Physics in 2005, a fellow of SIAM in 2009 and a member of the Chinese Academy of Sciences in 2011. He was invited to speak at the International Congress of Mathematicians in 2002, and at the Annual Meeting of the American Mathematical Society in 2003. In 2012 he became a fellow of the American Mathematical Society.