



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: May 20, 2022 (Friday)

Time: 9:00–10:00am (Hong Kong Time)

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

Towards Third Wave AI: Interpretable, Robust Trustworthy Machine Learning for Diverse Applications in Science and Engineering

*Speaker: Professor Guang Lin
Purdue University*

Abstract: This talk aims to close the gap by developing new theories and scalable numerical algorithms for complex dynamical systems that can be realistically predicted and validated. We are creating new technologies that can be translated into more secure and reliable new trustworthy AI systems that can be deployed for real-time complex dynamical system prediction, surveillance, and defense applications to improve the stability and efficiency of complex dynamical systems and national security of the United States. We will present a novel neural homogenization-based physics-informed neural network (NN) for multiscale problems. We will also introduce new NNs that learn functionals and nonlinear operators from functions with simultaneous uncertainty estimates.

Bio: Prof. Lin is a Full Professor in the School of Mechanical Engineering and Department of Mathematics at Purdue University. He is the Director of Data Science Consulting Service that performs cutting-edge research on data science and provides hands-on consulting support for data analysis and business analytics. He is also the Chair of the Initiative for Data Science and Engineering Applications at the College of Engineering. Prof. Lin received his Ph.D. from Brown University in 2007 and worked as a Research Scientist at DOE Pacific Northwest National Laboratory before joining Purdue in 2014. His research interests include diverse topics in computational and predictive science and statistical learning both on algorithms and applications. A main current thrust is stochastic simulation--in the context of uncertainty quantification, statistical learning and beyond, and multiscale modeling of physical and biological systems. Besides mentoring many outstanding students and postdocs, serving on the editorial board of several prestigious journals, Prof. Lin has received various awards, such as the NSF CAREER Award, Mid-Career Sigma Xi Award, University Faculty Scholar, Mathematical Biosciences Institute Early Career Award, and Ronald L. Brodzinski Award for Early Career Exception Achievement.