CAMT Seminar

“Physics Informed Artificial Intelligence”

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Date: November 29th, 2022 (Tue) 14:00-15:00
Location: Main Conference Room (1st floor), Bldg. A12
Center for Atomic and Molecular Technologies (CAMT)
Bldg. A12, 1st floor Meeting Room & Webex Link (hybrid)

Abstract

In simulations of multiphysics problems using the numerical discretization of partial differential equations (PDEs), one still cannot seamlessly incorporate noisy data into existing algorithms, mesh generation remains complex, and high-dimensional problems governed by parameterized PDEs cannot be tackled. Moreover, solving inverse problems with hidden physics is often prohibitively expensive and requires different formulations and elaborate computer codes. Machine learning has emerged as a promising alternative, but training deep neural networks requires big data, not always available for scientific problems. Instead, such networks can be trained from additional information obtained by enforcing the physical laws (for example, at random points in the continuous space-time domain). Such physics-informed learning integrates (noisy) data and mathematical models, and implements them through neural networks or other kernel-based regression networks. We will review some of the prevailing trends in embedding physics into machine learning.

(Host: Satoshi Hamaguchi Ext：7913)