Department of Applied Mathematics Seminar

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Topic
New Improvements and Applications of the Source Iteration Method

Date | Time
19 June 2025 (Thursday) | 11:00am – 12:00nn (HK Time)

Venue
TU817

Abstract:
The source iteration method is a classical numerical technique for solving the radiative transport equation (RTE), an integro-differential model fundamental to many scientific and engineering disciplines. In this presentation, I will first introduce a new improvement to the classical method by incorporating randomness into the iteration process, termed the random source iteration method. This approach not only facilitates efficient parallelization but also mitigates the notorious ray effect inherent in deterministic solutions.

Subsequently, I will discuss a mesh-free neural operator framework, DeepRTE, designed to solve the RTE. DeepRTE leverages the mathematical structure of the source iteration method to embed physical constraints directly into its architecture, creating a physics-informed neural network. This design enables DeepRTE to achieve high accuracy while significantly reducing the number of trainable parameters compared to conventional deep learning approaches.

ALL ARE WELCOME