THE UNIVERSITY  OF HONG KONG

Institute of Mathematical Research
Department of Mathematics

Numerical Analysis Seminar

Adjoint Monte Carlo Methods for Kinetic Equation Constrained Optimization

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Abstract

This talk will focus on developing adjoint Monte Carlo methods for solving optimization problems governed by kinetic equations, a common challenge in areas such as plasma control and device design. These optimization problems are particularly demanding due to the high dimensionality of the phase space and the randomness in evaluating the objective functional, a consequence of using a forward Monte Carlo solver. To overcome these difficulties, a range of "adjoint Monte Carlo methods" have been devised. These methods skillfully combine Monte Carlo gradient estimators with PDE-constrained optimization, introducing innovative solutions tailored for kinetic applications. We will provide a comprehensive guide on how to integrate Monte Carlo gradient techniques within both the optimize-then-discretize and the discretize-then-optimize frameworks from PDE-constrained optimization.

Date:	May 22, 2024 (Wednesday)
Time:	10:00 – 11:00am
Venue:	ZOOM: https://hku.zoom.us/j/ Meeting ID: 913 6532 3891 Password: 310656

All are welcome