

THE UNIVERSITY



OF HONG KONG

*Institute of Mathematical Research
Department of Mathematics*

Numerical Analysis Seminar

Analysis and Computation of Wasserstein Geometric Flow in Parameter Space

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Abstract

We introduce a new parameterization strategy that can be used to design algorithms simulating geometric flows on Wasserstein manifold, the probability density space equipped with optimal transport metric. The framework leverages the theory of optimal transport and the techniques like the push-forward operators and neural networks, leading to a system of ODEs for the parameters of neural networks. The resulting methods are mesh-less, basis-less, sample-based schemes that scale well to higher dimensional problems. The strategy works for Wasserstein gradient flows such as Fokker-Planck equation, and Wasserstein Hamiltonian flow like Schrodinger equation. Theoretical error bounds measured in Wasserstein metric is established. This presentation is based on joint work with Yijie Jin (Math, GT), Shu Liu (UCLA), Has Wu (Wells Fargo), Xiaojing Ye (Georgia State), and Hongyuan Zha (CUHK-SZ).

Date: July 5, 2024 (Friday)

Time: 15:00pm - 16:00pm

Venue: Room 210, Run Run Shaw Building
HKU

All are welcome