THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON DATA SCIENCE AND APPLIED MATHEMATICS

An information geometric and optimal transport framework

for Gaussian processes

By

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Abstract

Information geometry (IG) and Optimal transport (OT) have been attracting much research attention in various fields, in particular machine learning and statistics. In this talk, we present results on the generalization of IG and OT distances for finite-dimensional Gaussian measures to the setting of infinite-dimensional Gaussian measures and Gaussian processes. Our focus is on the Entropic Regularization of the 2-Wasserstein distance and the generalization of the Fisher-Rao distance and related quantities. In both settings, regularization leads to many desirable theoretical properties, including in particular dimension-independent convergence and sample complexity. The mathematical formulation involves the interplay of IG and OT with Gaussian processes and the methodology of reproducing kernel Hilbert spaces (RKHS). All of the presented formulations admit closed form expressions that can be efficiently computed and applied practically. The mathematical formulations will be illustrated with numerical experiments on Gaussian processes.

Date : **27 May 2024 (Monday)**
Time : **10:30a.m.**
Venue : **Room 1410 (near lift 25/26)**

All are Welcome!