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THE HONG KONG UNIVERSITY OF SCIENCE & TECHNOLOGY

Department of Mathematics

SEMINAR ON STATISTICS

Covariate-Elaborated Robust Partial Information Transfer with Conditional Spike-and-Slab Prior

By

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Abstract

Transfer learning has become a powerful tool for improving statistical efficiency by borrowing information from auxiliary datasets. However, most existing statistical transfer learning methods rely on global similarity assumptions between the source and target data, which can be overly restrictive and inefficient when only partial information is shared. In this talk, we will introduce CONCERT, a Bayesian transfer learning framework designed for robust and interpretable partial information transfer in high-dimensional settings. The key idea is to allow information sharing at the covariate level, rather than enforcing global similarity across datasets. This is achieved through a novel conditional spike-and-slab prior that adaptively learns which covariates should be transferred. A distinctive feature of CONCERT is that it provides a one-step procedure that simultaneously performs information transfer and target estimation. We establish theoretical guarantees, including variable selection consistency and error bounds, which reveal why partial information transfer learning is beneficial. To ensure scalability, CONCERT is implemented via a variational Bayes algorithm. We will demonstrate the advantages of CONCERT through simulations and real data examples, highlighting scenarios where partial information transfer leads to substantial gains over existing methods.

Date : 12 May 2026 (Tuesday)

Time : 2:00p.m.-3:00p.m.

Venue : Room 2463 (near Lift 25/26)

All are welcome!