INDIAN STATISTICAL INSTITUTE

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Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date: January 13, 2025 Time: 05:15 P.M.

Venue: L-infinity, Stat-Math Unit (5th Floor, A.N. Kolmogorov Bhavan), ISI Kolkata

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TITLE:

Orchestrated Approximate Message Passing: A new way of information integration from multimodal data

ABSTRACT:

Integrating information across correlated datasets is a central challenge in many contemporary data analysis problems. Despite numerous methods available for this purpose, the lack of clarity regarding their statistical properties poses significant hurdles to achieving robust statistical inference. In this talk, I shall introduce a novel method called Orchestrated Approximate Message Passing for integrating information across multiple correlated datasets. This method is both computationally efficient and statistically optimal under a stylized model, and its asymptotic properties enable users to construct asymptotically valid prediction sets.

Subsequently, I shall describe how to use the technique to construct cell atlases using multi-modal single-cell data and querying these atlases with partial molecular features. Finally, I shall present a technique for constructing prediction sets of the multi-modal spectral embeddings from new cells with only one observed modality, utilizing the atlas.

This talk is based on a joint work with Zongming Ma.

ALL ARE CORDIALLY INVITED