Theoretical Statistics and Mathematics Unit

Indian Statistical Institute

203 B.T. Road, Kolkata - 700108

SEMINAR

Date: December 07, 2026

Time: 04:15 PM

VENUE:

L-Infinity, 5th Floor, A.N. Kolmogorov Bhavan, ISI Kolkata

SPEAKER:

Rajarshi Mukherjee

Harvard University, USA

TITLE:

Minimax Exponents of Sparse Submatrix Detection and Beyond

ABSTRACT:

This talk has two parts. In the first part, we study the exact asymptotics of the minimax risk for detecting an elevated-mean sparse submatrix in a large Gaussian random matrix. Although we have a precise characterization of when and how asymptotic consistency is possible for such testing problems, we still have limited understanding of the exact minimax risk beyond 0-1 behavior. Our results fill this gap for sparse submatrix detection problems. This is a joint work with Subhajit Goswami (Tata Institute of Fundamental Research, Mumbai). In the second part of the talk, we discuss aspects of Lean formalism and Statlib, a verifiable library for mathematical statistics in Lean 4. Specifically, the first part of the talk addresses a problem with a potential information-theoretic and computational gap that makes it difficult to validate theoretical results through numerical simulations. In this regard, we will discuss the promise and challenges of developing an open-source, community-driven Lean 4 library for mathematical statistics to support verification of future theoretical results, as well as the subtleties and philosophies of using AI for autoformalization.

ALL ARE CORDIALLY INVITED

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