



INDIAN STATISTICAL INSTITUTE

203 B.T. Road, Kolkata-700108

Theoretical Statistics and Mathematics Unit

Monday Colloquium

Date: September 30, 2024

Time: 04:15 P.M.

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

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University of Chicago, USA

TITLE:

Gaussian Approximation For Non-stationary Time Series with Optimal Rate and Explicit Construction

ABSTRACT:

Statistical inference for time series such as curve estimation for time-varying models or testing for existence of change-point have garnered significant attention. However, these works are generally restricted to the assumption of independence and/or stationarity at its best. The main obstacle is that the existing Gaussian approximation results for non-stationary processes only provide an existential proof and thus they are difficult to apply. In this paper, we provide two clear paths to construct such a Gaussian approximation for non-stationary series. While the first one is theoretically more natural, the second one is practically implementable. Our Gaussian approximation results are applicable for a very large class of non-stationary time series, obtain optimal rates and yet have good applicability. Building on such approximations, we also show theoretical results for change-point detection and simultaneous inference in presence of non-stationary errors. Finally we substantiate our theoretical results with simulation studies and real data analysis.

ALL ARE CORDIALLY INVITED