

Indian Statistical Institute

Applied Statistics Unit

SEMINAR NOTICE

Speaker: Rahul Roy, St. Xaviers College

Title: Large-scale Adaptive Multiple Testing for Sequential Data Controlling False Discovery and Non-discovery Rates

Date: 28 November, 2023

Time: 16:15 PM

Venue: ASU Seminar Room

Online Platform: Google Meet (meet.google.com/jpn-juzz-hys)

Abstract: In this talk, we shall discuss multiple testing procedures with simultaneous control of false discovery and non-discovery rates when m -variate data vectors are observed sequentially or in groups. Existing multiple testing methods for sequential data use fixed stopping boundaries that do not depend on the sample size, and hence, are quite conservative when the number of hypotheses m is large. We first propose a sequential test based on an oracle statistic (given by the posterior probability of null) with adaptive stopping boundaries that shrink the “continue-sampling-region” as the sample size increases. This ensures a finite stopping time for finite m with exact control of the false discovery and false non-discovery rates at some prefixed levels. The stopping time converges in probability to a finite natural number n_0 for m growing to infinity. We also prove the superiority of our proposed method over the only existing method applicable in this setup for large m . Further, we develop a data-driven rule that guarantees simultaneous control of the false discovery and false non-discovery rates asymptotically as m tends to infinity. The data-driven stopping time is also shown to converge to the same finite constant as the oracle rule as m grows to infinity. Extensive analysis of simulated datasets illustrates the superiority of the proposed tests over some existing methods. Finally, we apply our method to a case-control GWAS problem.

Co-authors: Shyamal Krishna De and Subir Kumar Bhandari

All are invited to attend.

Please write to SOMENATH DAS somenath1011@isical.ac.in in case you do not receive the invitation link 48 hours before the seminar time.