



HARVARD
MEDICAL SCHOOL



HARVARD T.H. CHAN
SCHOOL OF PUBLIC HEALTH

Distinguished Guest Lecture Series 2024

Title: Nonregular Inference

Date & Time: 03/04 from 11:30-1:30 pm

Location: Countway Library room # CL1-032



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Abstract: Uncertainty quantification is an essential aspect of statistics and data science. Traditional inference methods rely on establishing standard limiting distributions, such as asymptotic normality by CLT. However, the complexity of modern data science requires more advanced uncertainty quantification tools. The traditional inference tools cannot be applied to a collection of nonregular inference problems, such as boundary constraint problems, singular problems, post-selection problems, machine learning-related algorithms, nonsmooth causal functionals, and dynamic treatment regimes.

In this talk, I shall discuss two general principles of handling nonregular inference. For the first principle, I mainly focus on repro-sampling (Xie & Wang, 2022). Inspired by this sampling idea, we present how to solve two challenging inference problems encountered in multi-source learning: statistical inference for distributionally robust learning (Guo, 2023a) and statistical inference for robust federated learning (Guo et al., 2023). We illustrate these proposals with multi-institutional EHR studies.

For the second principle, I discuss how to apply it to recover a variety of existing nonregular inference tools, including repro sampling (Xie & Wang, 2022), the Anderson-Rubin test, Universal Inference (Wasserman et al., 2020), Searching and Sampling (Guo, 2023b), and HulC (Kuchibhotla et al., 2021). These recently proposed methods enable deriving accurate and reliable results in various complex data science applications.



RSVP before Feb 28!
“Limited seating”

TRANSLATIONAL DATA SCIENCE



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