For favour of Posting

THE HONG KONG UNIVERSITY OF SCIENCE TECHNOLOGY

Department of Mathematics

MATHEMATICS COLLOQUIUM

Can Tabular Foundation Models Amortize Statistical Inference?

By

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Abstract

For decades, statistical inference has largely been developed one problem at a time. Given a scientific target, such as a treatment effect or a regression function, statisticians design a problem-specific estimator together with a procedure for quantifying its uncertainty. This paper proposes a different paradigm. We focus on a classical problem in statistical inference, confidence interval construction, and develop TabCon, an amortized inference system built on a tabular foundation model that produces confidence intervals for new datasets through a simple forward pass. The key methodological ingredients of TabCon are a sparse mixture-ofexperts architecture and reinforcement-learning-based post-training that calibrate the resulting confidence intervals to a desired coverage level. Across a wide range of benchmark datasets, TabCon attains near-nominal coverage while producing short confidence intervals. At inference time, it also offers considerably greater computational efficiency, running 50 times faster than the classical bootstrap procedure, even when the latter uses only 50 bootstrap samples.

Date : 11 December 2026 (Friday)
Time : 3:00pm - 4:00pm
Venue : Room 1409 (near Lift 25/26)

All Are Welcome!