

Title: Fast segmentation of watermarked texts from large language models through epidemic change-points framework

Speaker: Dr. Soham Bonnerjee, University of Chicago

Area: DS

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Abstract:

With the growing use of large language models, concerns over content authenticity have spurred a variety of watermarking schemes. These schemes use secret keys to detect machine-generated text while remaining imperceptible to readers. Detection typically reduces statistical hypothesis testing for the presence of watermarks, a topic that is now well studied. In contrast, the finer-grained task of localizing which segments of a text are watermarked is much less explored; existing approaches often lack scalability or guarantees robust to paraphrasing and post-editing. We bring a new perspective to this segmentation problem through the lens of *epidemic change-points* and, by exploiting this connection, propose **WISER**, a novel and computationally efficient watermark segmentation algorithm. We establish finite-sample error bounds and consistency for detecting multiple watermarked segments in a single text. Complementing these theoretical results, our extensive numerical experiments show that **WISER** outperforms state-of-the-art baseline methods, both in terms of computational speed as well as accuracy, on various benchmark datasets embedded with diverse watermarking schemes. Together, these theoretical and empirical results position **WISER** as an effective tool for watermark localization and illustrate how classical statistical ideas can yield theoretically valid and computationally efficient solutions to a modern problem of immediate importance. Based on joint work with Sayar Karmakar (UFlorida), and Subhrajyoty Roy (WuStL).

Speaker Profile:



Soham Bonnerjee recently completed his PhD in Statistics at the University of Chicago, advised by Wei Biao Wu. His research lies at the intersection of time series, statistical learning theory, and inference under complex dependence, with recent work on large language models, stochastic optimization, and reinforcement learning. Previously, he obtained his Bachelor and Masters in Statistics degree from the Indian Statistical Institute, Kolkata.

Webpage Link: <https://sohamb01.github.io/index.html>