
Nyström M-HSIC*

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Abstract

Kernel techniques underlie some of the most well-known and powerful dependence measures in machine learning and statistics such as the Hilbert-Schmidt independence criterion (HSIC; a.k.a. distance covariance), with numerous successful applications. However, this flexibility has a computational price: kernel methods (including the classical closed-form HSIC estimator) often scale quadratically w.r.t. the sample size. To mitigate this severe computational bottleneck, multiple approximations for HSIC have been proposed. These estimators, however, are restricted to $M = 2$ random variables, do not generalize naturally to the $M \geq 2$ case, and lack theoretical guarantees. I am going to discuss a Nyström-based HSIC estimator which resolves the aforementioned shortcomings, with illustration of its efficiency in dependency testing of media annotations and causal discovery. [paper]

*CMStatistics-2023: Advances in kernel methods and Gaussian processes session, Berlin, Germany (Dec. 16-18, 2023); abstract.