Prof. Dr. Greg Rice
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Title:

"Two-sample tests for relevant differences in the eigenfunctions of covariance operators"

Abstract:

We consider the problem of evaluating whether two sets of functional time series observations share the shape of their primary modes of variation as encoded by the eigenfunctions of the respective covariance operators. A novel testing approach is introduced that connects with, and extends, existing literature in two main ways. First, tests are set up in the relevant testing framework, where interest is not in testing an exact null hypothesis but rather in detecting deviations deemed sufficiently relevant, with relevance determined by the practitioner and perhaps guided by domain experts. Second, the proposed test statistics rely on a self-normalization principle that helps to avoid the notoriously difficult task of estimating the long-run covariance structure of the underlying functional time series. The main theoretical result of the talk is the derivation of the large-sample behavior of the proposed test statistics. Empirical evidence, indicating that the proposed procedures work well in finite samples and compare favorably with competing methods, is provided through a simulation study, and an application to annual temperature data.