

Nonparametric predictive inference for reproducibility of basic nonparametric tests

Frank Coolen
Durham University

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Reproducibility of tests is an important characteristic of the practical relevance of test outcomes. Recently, there has been substantial interest in the reproducibility probability (RP), where not only its estimation but also its actual definition and interpretation are not uniquely determined in the classical frequentist statistics framework. Nonparametric predictive inference (NPI) is a frequentist statistics approach that makes few assumptions, enabled by the use of lower and upper probabilities to quantify uncertainty, and which explicitly focuses on future observations. The explicitly predictive nature of NPI provides a natural formulation for inferences on RP. We introduce the NPI approach to RP for some basic nonparametric tests, where exact results are achievable for relatively small sample sizes. We also discuss implementation of the approach in case of larger data sets and other tests, which is possible via an NPI-based bootstrap approach. (This is joint work with Sulafah BinHimd, who will defend her PhD thesis on 5 November.)