Low intensity resampling methods with applications to two sample unbalanced problems.

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Resampling methods are frequently used in practice to adjust critical values of nonparametric tests. A resampling method can usually be described in terms of an exchangeable scheme, \((W_n(1), \ldots, W_n(k_n))\), satisfying

\[
\max_{1 \leq i \leq k_n} |W_n(i) - \bar{W}_n| \to 0 \quad \text{Pr.} \quad \text{and} \quad \sum_{i=1}^{k_n} (W_n(i) - \bar{W}_n)^2 \to 1, \quad \text{Pr.}
\]

with \(\bar{W}_n = \frac{1}{k_n} \sum_{i=1}^{k_n} W_n(i)\). Recently, in [1, 2], complete asymptotic results have been given for linear resampling statistics

\[
T^*_n = \sqrt{k_n} \sum_{i=1}^{k_n} W_n(i)(X_{n,i} - \bar{X}_n),
\]

under the (mild) assumption that

\[
\sqrt{k_n}(W_n(1) - \bar{W}_n) \to Z
\]

for some nondegenerate limit random variable \(Z\). This covers the study of two-sample linear permutation statistics for balanced samples, that is, for samples of sizes \(n_1, n_2\), such that \(n_1/(n_1 + n_2) \to c \in (0, \infty)\). In a low intensity resampling scheme we have

\[
\sqrt{k_n}(W_n(1) - \bar{W}_n) \to 0. \quad \text{Pr.}
\]

This corresponds to the unbalanced case in which \(n_1/(n_1 + n_2) \to 0\), a case of practical significance. In this talk we will provide asymptotics for linear resampling statistics in the low intensity setup.

References


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