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SEMINAR

"Finite-sample consistency of combination-based permutation tests with application to repeated measures designs"

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Abstract:

In several application fields, e.g. genetics, image and functional data analysis, biomedical and social experimental and observational studies, etc. it may happen that the number of observed variables is very much larger than that of subjects.

It can be proved that, for a given and fixed number of subjects, when the number of variables increases and the global standardized noncentrality parameter of the underlying population distribution increases with respect to each added variable, then the power of multivariate permutation tests based on Pesarin's nonparametric combining functions (Pesarin, 2001) is monotonically increasing. These results confirm and extend those presented by Blair et al. (1994).

Moreover, they allow us to introduce the property of finite-sample consistency for those kinds of combination-based permutation tests.

Sufficient conditions are given in order that the rejection rate converges to one, for fixed sample sizes at any attainable α -values, when the number of variables and the global standardized noncentrality both diverge.

A simulation study and a real case study are presented.