Nonparametric tests for interval data

Przemysław Grzegorzewski and Martyna Śpiewak

Faculty of Mathematics and Information Science,
Warsaw University of Technology

Interval data have drawn an increasing interest recently. However, one should be aware that closed intervals applied for modeling data may deliver two different types of information: the imprecise description of a point-valued quantity (epistemic view) or the precise description of a set-valued entity (ontic view). Each view yields its own approach to data analysis and the way of carrying on the statistical inference (Couso & Dubois, 2014). In hypothesis testing a type of available interval data has an impact on hypotheses formulation, test construction, the way of making final decisions and their interpretation. We illustrate these differences showing generalizations of some well-known nonparametric one-sample and two-sample tests into interval data framework. We also discuss the properties of the considered tests.

References

[1] Couso I., Dubois D., *Statistical reasoning with set-valued information: Ontic vs. epistemic views,* International Journal of Approximate Reasoning 55 (2014), 1502-1518.

[2] Grzegorzewski P., Śpiewak M., *The sign test for interval-valued data,* In: Soft Methods for Data Science, Ferraro M.B. et al. (Eds.), Springer 2016, pp. 269-276.

[3] Perolat J., Couso I., Loquin K., Strauss O., *Generalizing the Wilcoxon rank-sum test for interval data,* International Journal of Approximate Reasoning 56 (2015), 108-121.