

CircNNTSR: An R Package for the Statistical Analysis of Circular Data Based on Nonnegative Trigonometric Sums

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In Fernández-Durán (2004), a new family of circular distributions based on nonnegative trigonometric sums (NNTS models) is developed. Contrary to the great majority of families of circular distributions, this family allows to model datasets that present multimodality and/or skewness. Initially, the maximum likelihood estimates of the parameters of the NNTS family were obtained by algorithms based on Sequential Quadratic Programming (SQP) that were difficult to implement in R and take a long time to converge. Because the parameter space of the NNTS family is the surface of the hypersphere, an efficient Newton-like algorithm on manifolds is generated in order to obtain the maximum likelihood estimates of the parameters. This algorithm is implemented in the R package **CircNNTSR**. Examples of the application of **CircNNTSR** for testing seasonality and homogeneity in problems in biology, actuarial science and environmetrics are presented.

References

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