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Sparse and smooth cluster analysis of functional data

Monday, 13 September 2021 16:15 (30 minutes)

The sparse and smooth clustering (SaS-Funclust) method proposed in [1] is presented. The aim is to cluster functional data while jointly detecting the most informative portion(s) of the functional data domain. The SaS-Funclust method relies on a general functional Gaussian mixture model with parameters estimated by maximizing the sum of a log-likelihood function penalized by a functional adaptive pairwise penalty and a roughness penalty. The functional adaptive penalty is introduced to automatically identify the informative portion of domain by shrinking the means of separated clusters to some common values. At the same time, the roughness penalty imposes some smoothness to the estimated cluster means. The proposed method is shown to effectively enhance the solution interpretability while still maintaining flexibility in terms of clustering performance. The methods are implemented and archived in an R package *sasfunclust*, available on CRAN [2].

[1] Centofanti, F., Lepore, A., Palumbo, B. (2021). Sparse and Smooth Functional Data Clustering. Preprint arXiv:2103.15224
[2] Centofanti F., Lepore A., Palumbo B. (2021). sasfunclust: Sparse and Smooth Functional Clustering. R package version 1.0.0. [https://CRAN.R–project.org/package=sasfunclust]

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