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13th Scientific Meeting of the Classification and Data Analysis Group
Firenze, September 9-11, 2021

edited by

Giovanni C. Porzio

Carla Rampichini

Chiara Bocci



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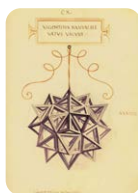
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MODEL-BASED CLUSTERING FOR CATEGORICAL DATA VIA HAMMING DISTANCE

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ABSTRACT: In this work a model-based approach for clustering categorical data with no natural ordering is introduced. The proposed method exploits the Hamming distance to define a family of probability mass functions to model categorical data. The elements of this family are considered as kernels of a finite mixture model with unknown number of components. Fully Bayesian inference is provided using a sampling strategy based on a trans-dimensional blocked Gibbs-sampler, facilitating computation with respect to the customary reversible-jump algorithm. Model performances are assessed via a simulation study, showing improvements both in terms of prediction and estimation, with respect to existing approaches. Finally, our method is illustrated with application to reference datasets.

KEYWORDS: Hamming distribution, mixture modelling, categorical data analysis, blocked Gibbs Sampling