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which the exact m ranges from 1.47 to 2.69. The approximation's errors become considerably larger for v=(0.2, 0.263] or, equivalently, for m=(2.69, 3.56] where they vary from 0.8% to 15%. For auxetic materials with extreme negative values the errors of the approximation are much smaller increasing from 1% to 2.7% as Poisson's ratio v decreases from -0.6 and -1, or, equivalently, as m decreases from 1.47 to 1.37. In conclusion, an approximation for the relationship between Poisson's ratio and angle of incidence for complete elastic body wave conversion has been proposed which facilitates evaluation of the structural integrity of materials from ultrasonic data.

Hierarchical Cluster Analysis of Groups of Individuals: Application to Business Data

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In this work, classical as well as probabilistic hierarchical clustering models are used to look for typologies of H independent groups of individuals in two contexts: classical three-way data and symbolic/complex data. We present one example on the business area, in which the data are issued from a questionnaire in order to evaluate the satisfaction and quality with the services provided to customers by an automobile company. The Agglomerative Hierarchical Cluster Analysis is based on appropriated extensions of the basic affinity coefficient. The used probabilistic aggregation criteria - in the scope of the *VL* methodology (*V for Validity, L for Linkage*) - resort essentially to probabilistic notions for the definition of the comparative functions.

The clustering of independent groups of individuals was made according to two strategies: one based on a particular case of the generalized weighted affinity coefficient for the case of a classical three-way data table, and the other one based on the weighted generalized affinity coefficient for modal variables.

In the first approach, the data were initially represented in H sub-tables (one sub-table for each of the groups of individuals), containing, respectively, $N_1, N_2, \ldots, N_H$, individuals described by p identical variables. Later H new sub-tables, each one containing the same number m= $min\{N_1, N_2, \ldots, N_h\}$ of individuals (selected from a stratified random sampling) had to be obtained from the initial corresponding sub-tables. Thus, in this case, we loss information because we can't work with all the sample but only with a stratified random subsample. Contrary, in the second approach it is possible to work with the entire dataset.

The clustering results provided by both strategies were compared, and the differences found between the satisfaction typologies were due to the smaller number of individuals of each group when we apply the first approach as a consequence of the sampling process. Nevertheless, we might have opted by inquiring a largest number of individuals in each group, during the planning of the investigation. We used the global statistics of levels (*STAT*) to evaluate the obtained partitions in the agglomerative hierarchical clustering.

Keywords: Hierarchical cluster analysis, Affinity coefficient, independent groups of individuals, *VL* Methodology, Three-way data, Symbolic data.

Applications of the Bayesian and the Trimmed Likelihood Estimation in Multitype Branching Processes

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In our work we consider illustrative examples of multitype branching processes, allowing for Bayesian estimation and the explicit calculation of the breakdown point of the trimmed likelihood estimators of the individual distributions of the process. The estimators use several independent family trees of the processes and their advantage in the presence of oultiers is shown via simulations and computational results.

Keywords: Multitype branching processes, Bayesian estimation, Trimmed likelihood, Breakdown point

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Inference for Quantile Measures of Peakedness

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The peakedness measure of Horn (37:55-56, 1983, *The American Statistician*) is here extended to arbitrary densities so that it can detect bimodality. Ruppert (41:1-5.1987, *The American Statistician*) introduced a class of measures of peakedness defined as the ratio of two interfractile ranges pi_{q,r}=R_q/R_r, where R_r=x_{1-r}-x-r$ is the difference of two quantiles, and 0<q<r<0.5. He showed that pi_{q,r} satisfied certain convexity requirements expected of a measure of kurtosis and shared by the classical measure of kurtosis defined in terms of moments; however, the new measures were not affected by extreme outliers. Ruppert derived and compared the influence functions of these