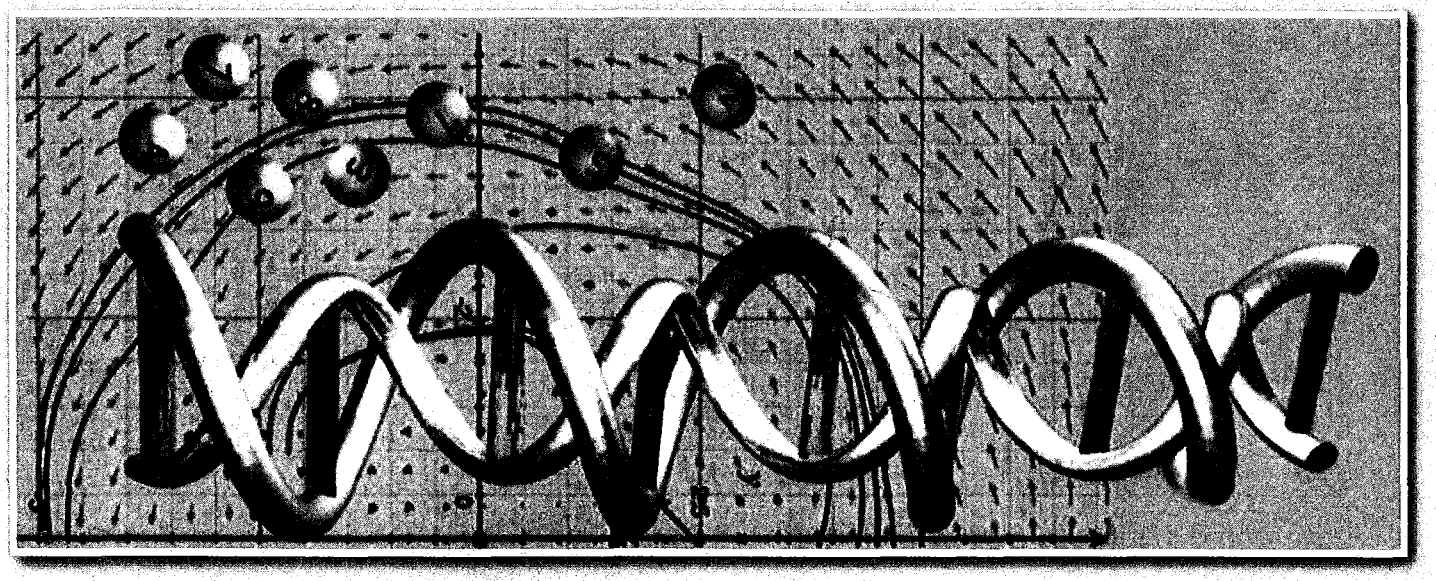
6th WORKSHOP ON STATISTICS, MATHEMATICS AND COMPUTATION

3rd PORTUGUESE - POLISH WORKSHOP ON BIOMETRY



BOOK OF ABSTRACTS

July, 3 - 4 | 2012

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Título: Book of Abstracts - 6^{th} Workshop on Statistics, Mathematics and Computation - 3^{rd} Portuguese Polish Workshop on Biometry
Published and printed by: Instituto Politécnico de Tomar
Editors: (Teresa Oliveira, Universidade Aberta), (Stanislaw Mejza, Poznan University of Life Sciences), (Dário Ferreira, Universidade da Beira Interior), (Amílcar Oliveira, Universidade Aberta), (Luís Grilo, Instituto Politécnico de Tomar)
N.º de Depósito Legal: 345933/12
ISBN: 978-972-9473-62-3

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Clustering of Symbolic Data based on Affinity Coefficient: Application to real data sets

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Abstract: The increasing use of databases, often large ones, in diverse areas of study makes it pertinent to summarise data in terms of their most relevant concepts. These concepts may be described by types of complex data, also known as symbolic data. In a symbolic data table, lines correspond to symbolic objects (SO's) and columns to symbolic variables, which may contain not just one value, as usual, but values, such as subsets of categories, intervals in real axes, or frequency distributions. Symbolic data arise in a number of different ways (for example, as the result of aggregation of large data sets to obtain a data set of manageable size, or as a result of some scientific question(s) of interest). The aim of Symbolic Data Analysis (SDA) is to extend classical data analysis techniques to these kinds of data.
Based on the affinity coefficient between two discrete probability distributions as defined by the pioneer work of Matusita, started in 1951, Bacelar-Nicolau suggested the use of the affinity coefficient as a basic similarity coefficient between the columns or the lines of a data matrix. Later on she extended that coefficient to different types of data, including complex data (symbolic data) and variables of mixed types (heterogeneous data), possibly with different weights.
We present some results from the Ascendant Hierarchical Cluster Analysis (AHCA) of symbolic objects described by interval data, in order to illustrate the effectiveness of the Ascendent Hierarchical Cluster Analysis based on the weighted generalized affinity coefficient, for symbolic data. The measure of comparison between the elements was combined with classical aggregation criteria and probabilistic ones. The probabilistic aggregation criteria used in this study belong to a parametric family of methods in the scope of the probabilistic approach of AHCA, named VL methodology and the validation of the clustering results is based on some validation measures. Finally, we compare the results achieved by our approach with the ones obtained by other authors.

Keywords: Ascendant Hierarchical Cluster Analysis, Symbolic Data, Interval Data, Affinity Coefficient, VL Methodology.

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