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On palindromic Ising models with graph structure.

Abstract: An example of a palindromic sentence, which respects the spacings between words, is "step on no pets". It gives the same sentence when read in reverse order. This symmetry notion is applied to Bernoulli distributions. Palindromic Bernoulli distributions have uniform margins and their covariance matrix coincides with the correlation matrix. More importantly, they are now known to be characterized by missing odd-order interactions, no matter whether these are of the linear, log-linear or multivariate logistic type.

For Ising models with palindromic structure, there are at most two-factor log-linear interactions and no log-linear main effects, so that the vanishing of a single canonical parameter shows −− just as in joint Gaussian distributions −− conditional independence given all remaining variables. In addition, this is often, but not always, equivalent to a graph-structured partial correlation matrix, a standardized version of the inverse covariance matrix.

In this lecture, I also concentrate on additional special features which arise when the partial correlation matrices have further simplified structure. This relates to previous results by Hoesgard and Lauritzen (2008).

This talk is based on joint work with Giovanni Marchetti, University of Florence

References:

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