Can we identify a max-linear model on a DAG by the tail dependence coefficient matrix ?

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Abstract

We investigate multivariate regularly varying random vectors with discrete spectral measure induced by a directed acyclic graph (DAG). The tail dependence coefficient measures extreme dependence between two vector components, and we investigate how the matrix of tail dependence coefficients can be used to identify the full dependence structure of the random vector on a DAG or even the DAG itself. Furthermore, we estimate the distributional model by the matrix of empirical tail dependence coefficients. From these observations we want to infer the causal dependence structure in the data.

N. Gissibl, C. Klüppelberg and M. Otto (2017)
Tail dependence of recursive max-linear models with regularly varying noise variables.
Submitted.

R. Schmidt and U. Stadtmüller (2006)
Non-parametric estimation of tail dependence.
Scandinavian Journal of Statistics, 33(2):307–335.