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Titel des Beitrags: Tail dependence of recursive max-linear models with regularly varying noise variables

Abstract: Recursive max-linear structural equation models with regularly varying noise variables are considered. Their causal structure is represented by a directed acyclic graph (DAG). The problem of identifying a recursive max-linear model and its associated DAG from its matrix of pairwise tail dependence coefficients is discussed. For example, it is shown that if a causal ordering of the associated DAG is additionally known, then the minimum DAG representing the recursive structural equations can be recovered from the tail dependence matrix. For a relevant subclass of recursive max-linear models, identifiability of the associated minimum DAG from the tail dependence matrix and the initial nodes is shown. Algorithms find the associated minimum DAG for the different situations. Furthermore, given a tail dependence matrix, an algorithm outputs all compatible recursive max-linear models and their associated minimum DAGs.

Stichworte: Causal inference; Directed acyclic graph; Extreme value theory; Graphical model; Max-linear model; Max-stable model; Regular variation; Structural equation model; Tail dependence coefficient

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