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CONDITIONAL INDEPENDENCE IN MAX-LINEAR GRAPHICAL MODELS

Abstract: Max-linear graphical models ([1]) on directed acyclic graphs exhibit atypical behaviour w.r.t. conditional independence, due to semi-deterministic cascading of effects from extreme events. In particular their conditional independence models are typically non-faithful to the generating DAG ([2]). We exploit results from tropical linear algebra to control these effects, leading to a complete description of valid conditional independence statements for such models.

This talk is based on joint work with Carlos Améndola, Claudia Klüppelberg, and Ngoc Tran.

References:

- [1] N. Gissibl and C. Klüppelberg (2018). Max-linear models on directed acyclic graphs. *Bernoulli* **24**, 2693–2720.
- [2] C. Klüppelberg and S. Lauritzen (2020). Bayesian networks for max-linear models. In F. Biagini, G. Kauermann, and T. Meyer-Brandis, editors, *Network Science - An Aerial View from Different Perspectives*. Springer-Verlag. Preprint available at arXiv:1901.03948.