

Layer dependence as a measure of local dependence

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A new measure of local dependence called “layer dependence” is analysed and illustrated. Layer dependence measures dependence between two variables at different percentiles in their joint distribution. Layer dependence satisfies coherence properties similar to Spearman's correlation, such as lying between -1 and 1, with -1, 0 and 1 corresponding to countermonotonicity, independence and comonotonicity, respectively. Spearman's correlation is a weighted average of layer dependence at different percentiles. Alternate overall correlation measures are arrived by varying the weights. Layer dependence allows copulas to be fitted and tailored to data and expert opinion on the dependence structure.