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Alternating Tensors and Rank Learning

Consider a collection of voters (e.g. viewers) each having rated a small fraction of a collection of alternatives (e.g. movies). Pairwise and triplewise comparisons of the ratings encode essentially all relevant information required to measure consensus and inconsistencies. These are naturally modelled by alternating tensors (skew-symmetric matrices and hypermatrices). The Hodge decomposition may then be applied to obtain a global ranking and an accompanying 'certificate of reliability'. This is joint work with Y. Yao.