The use of spatial information in entropy measures

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Speaker:

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Abstract:
A very recent proposal of a set of entropy measures for spatial data, based on building pairs of realizations, allows to split the data heterogeneity, usually assessed via Shannon’s entropy, into two components: spatial mutual information, identifying the role of space, and spatial residual entropy, measuring heterogeneity due to other sources. A further decomposition into partial terms deeply investigates the role of space at specific distances: the new set of spatial entropies satisfies a list of desirable properties. We also show that the approach is more general, better performing and more interpretable than the most popular proposals in the literature, thanks to the property of additivity and a new way of computing the entropy that explicitly discards the order within sets. A novel procedure for building the necessary quantities for computations is also provided. A comparative study illustrates the superior performance of the new set of measures over representative spatial configurations. Practical questions are answered by means of a case study on land use data.

The paper is co-authored with Linda Altieri and Giulia Roli - University of Bologna.