

SPECIAL SECTION ON MODERN MULTIVARIATE ANALYSIS

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A critically challenging problem facing statisticians is the identification of a suitable framework which consolidates data of various types, from different sources, and across different time frames or scales (many of which can be missing), and from which appropriate analysis and subsequent inference can proceed.

Special Section Guest Editor Susan Holmes has assembled four articles that demonstrate the power of the duality diagram approach for analyzing data of different formats. The first article by De la Cruz and Holmes introduces the duality diagram and provides examples of familiar multivariate approaches (e.g., principal components, correspondence analysis) that fit into this framework. In the second article, Dray and Jombart use this approach both to understand covariation structures and to identify spatial patterns in sociological data; this spatial application (crimes in France) requires the incorporation of spatial constraints into the framework. Thioulouse in the third article considers ecological data, which arise as sets of matrices for different species and different time points, in search of ecological changes in relationships between species and the environment. In the fourth article, Purdom develops an approach based on the duality diagram to combine genomic data with network information.

We hope that these articles will lead to the identification of further problems where the power of the duality diagram approach can be realized to deepen the analyses of data from multiple sources, types, and dimensions. We invite future submissions in this area that further develop the ideas in these articles and illustrate their advantages on real data.

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