Graph-theoretic methods for Data Visualization I: Pairwise display and the PairViz R package

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PairViz is an R package that produces orderings of statistical objects for visualization purposes. The problem of ordering is abstracted to one of constructing edge-traversals of (possibly weighted) graphs. PairViz implements various edge traversal algorithms which are based on Eulerian tours and Hamiltonian decompositions.

I will describe these algorithms, their PairViz implementation and discuss their properties and performance. Several visualization methods, including radial and parallel coordinates, and multiple comparison plots will be examined and improved by applying the tools of PairViz.

The required graph theory will be introduced and reviewed as needed. Some new applications of parallel coordinate plots to categorical data and to model comparison in regression will be used.

The intention is that users should be able to develop new visualization methods themselves by using PairViz.

This talk is based on joint work with Catherine Hurley of the National University of Ireland, Maynooth.