Multidimensional visualization and its applications

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Abstract

The desire to understand the underlying geometry of multidimensional problems motivated several visualization methodologies to augment our limited 3-dimensional perception. After a short overview, Parallel Coordinates are rigorously developed obtaining a 1-1 mapping between subsets of Euclidean $N$-space and subsets of 2-space. It leads to representations of lines, flats, curves, intersections, hypersurfaces, proximities and geometrical construction algorithms. Convexity can be visualized in ANY dimension as well as non-orientability (Moebius strip) and other properties of hypersurfaces. This is a VISUAL Multidimensional Coordinate System with applications to Air Traffic Control, Visual and Automatic Data Mining, Interactive Models of Complex Systems.

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