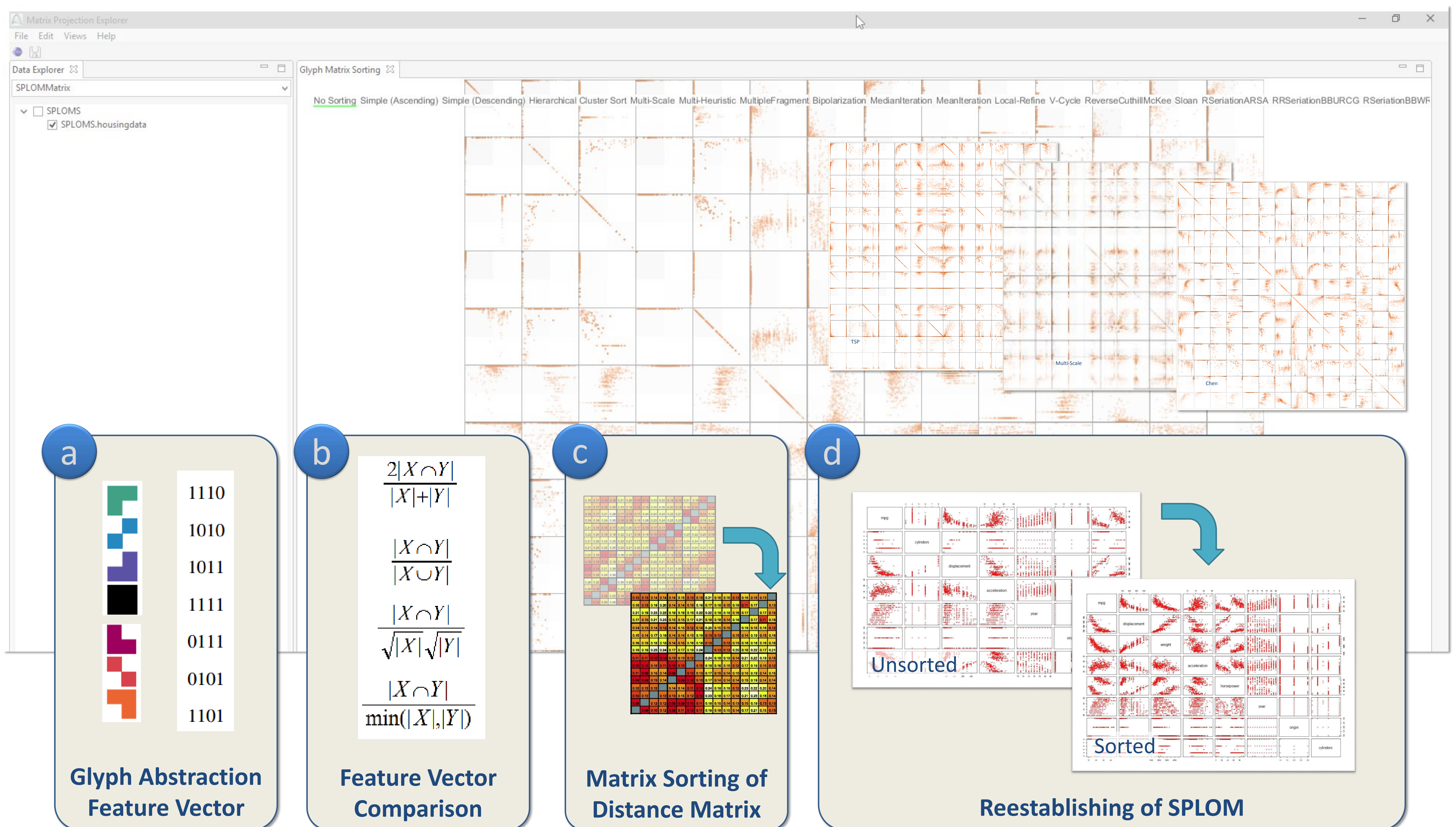


# Quality Metrics Driven Approach to Visualize Multidimensional Data in Scatterplot Matrix



## Overall Research Goals:

- (1) Derive representative and generalizable quality metrics for visualizations.
- (2) Apply metrics to amplify interesting patterns, as well as to mute the uninteresting noise for multi-dimensional visualizations [1,2].

## Scatterplot matrix (SPLOM) Sorting Approach:

Rearrange SPLOM cells by sorting scatterplot dimensions based upon their *visual quality*; Groups of adjacent visual patterns may form “*scatterplot motifs*” (helps analysts to gain a clear overview and to delve into specific areas of interest more easily).

## SPLOM Reordering Pipeline:

- (1) Scatterplots are encoded by its contained visual motif, such as presented in [3]. The motifs can be encoded into a binary feature vector by describing a space-filling z-curve starting from the top-left.
- (2) A pair-wise comparison of all scatterplot motifs with a preselected overlap feature vector comparison results in a distance matrix.
- (3) This distance matrix can be sorted with a standard 2D numeric sorting algorithm, such as TSP Ordering, Optimal-Leaf Ordering, or the Sloan sorting algorithm.
- (4) In the final step the distance matrix’s ordering can be applied to the initial SPLOM to achieve a visually coherent SPLOM ordering.