

Visualization Of Multivariate Networks

Masterstudium:
Visual Computing

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Introduction

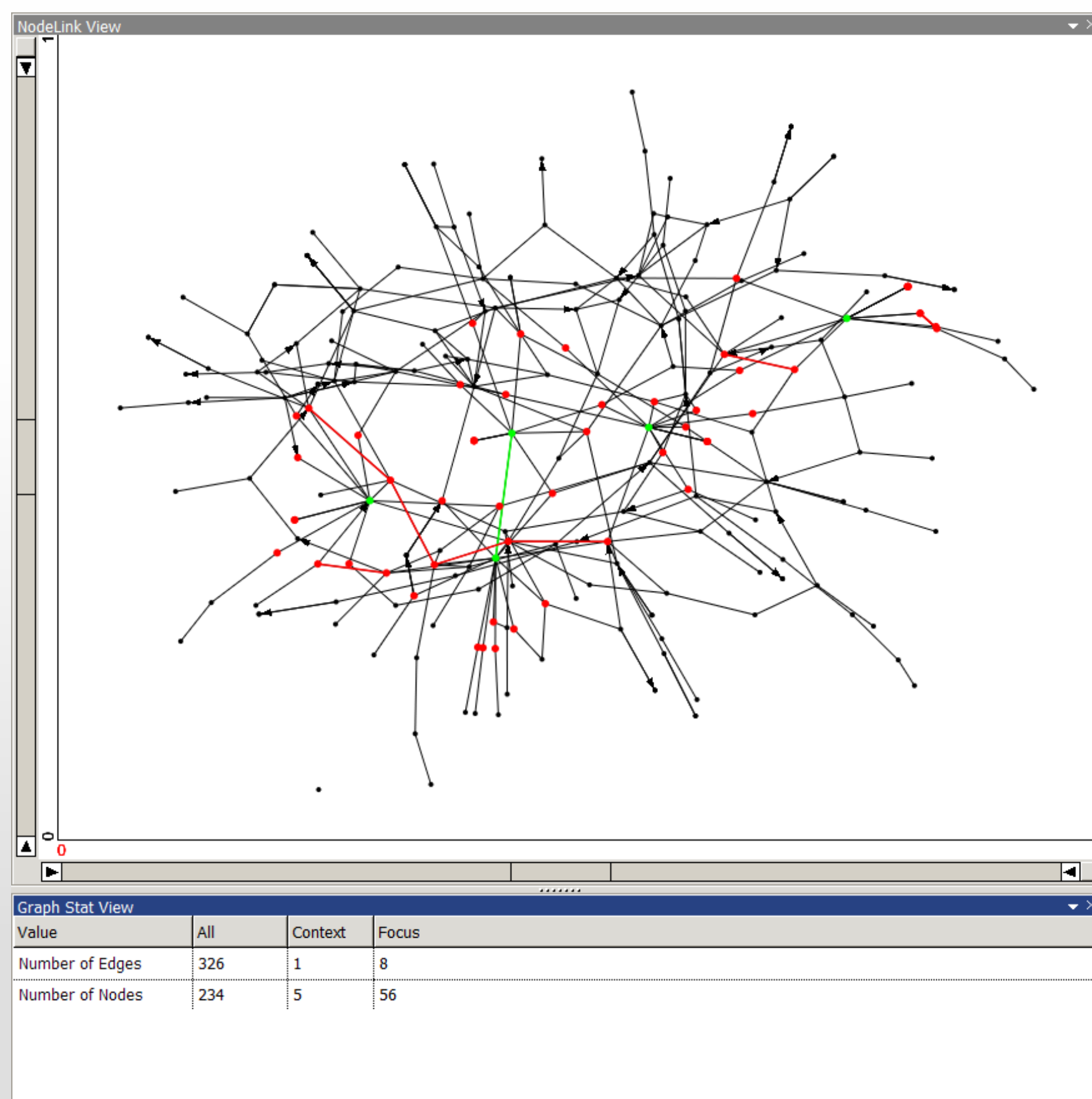
Multivariate networks are graphs that have additional data dimensions for each node and/or connection. Such multivariate graphs are prevalent in a number of different fields, including biological systems and social sciences.

In this thesis, an existing linked-view system for analyzing multivariate data has been extended for the analysis of networks.

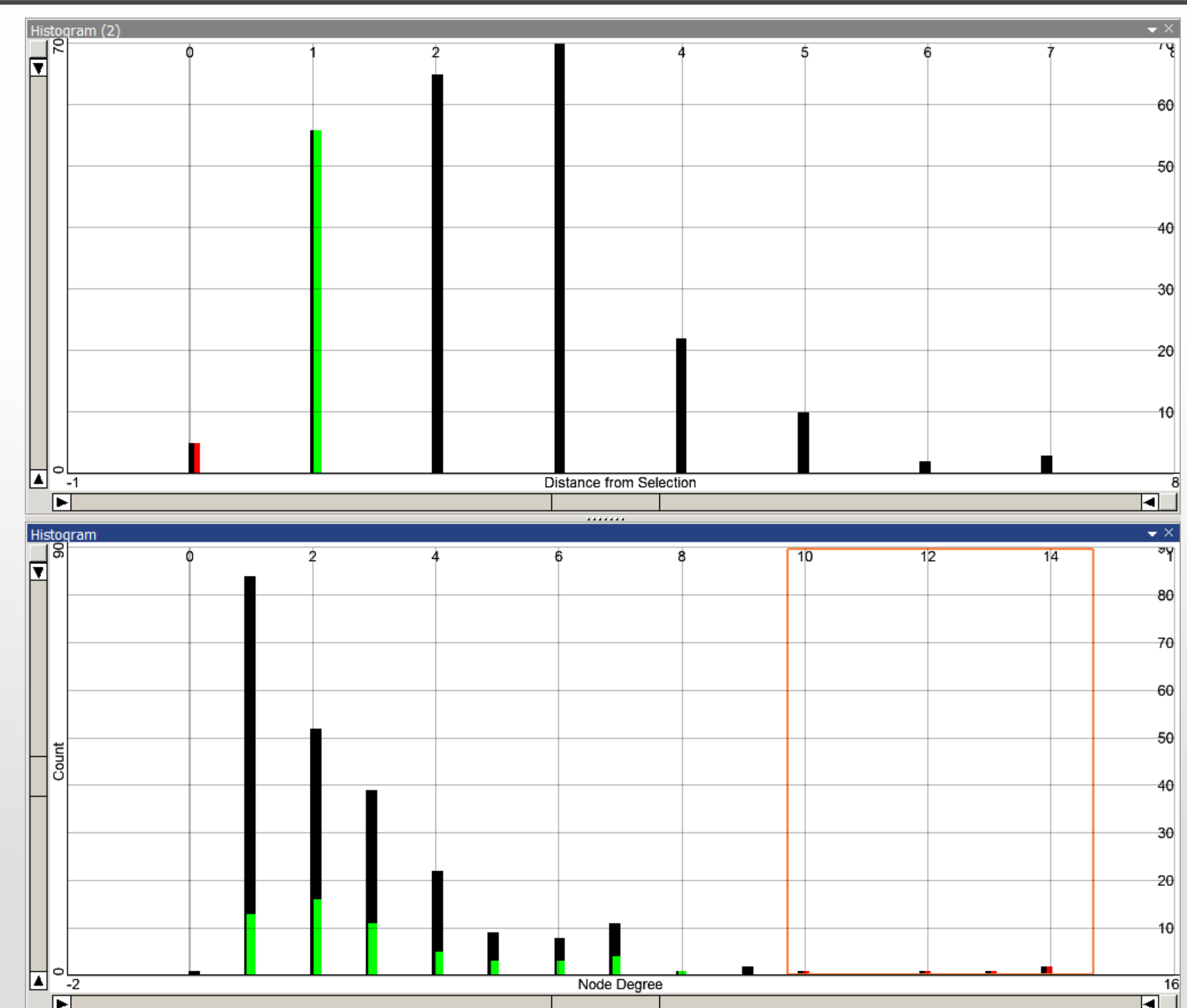
Analyze structural data

To analyze graphs using common views for data analysis (e.g. Parallel Coordinates) and tools (e.g. Linking & Brushing), data about the structure of the graph can be computed and added to the node data. The data can then be navigated similar to node data.

Values may refer to the currently selected nodes (e.g. shortest distance to a selected node) or optionally be computed considering only the selection.



A node-link view with additional information about the graph
(Red: Focus; Green: Context)



Selecting all nodes with 10 or more connections and then visualizing which nodes are adjacent to them.

Correlate node- and structure data

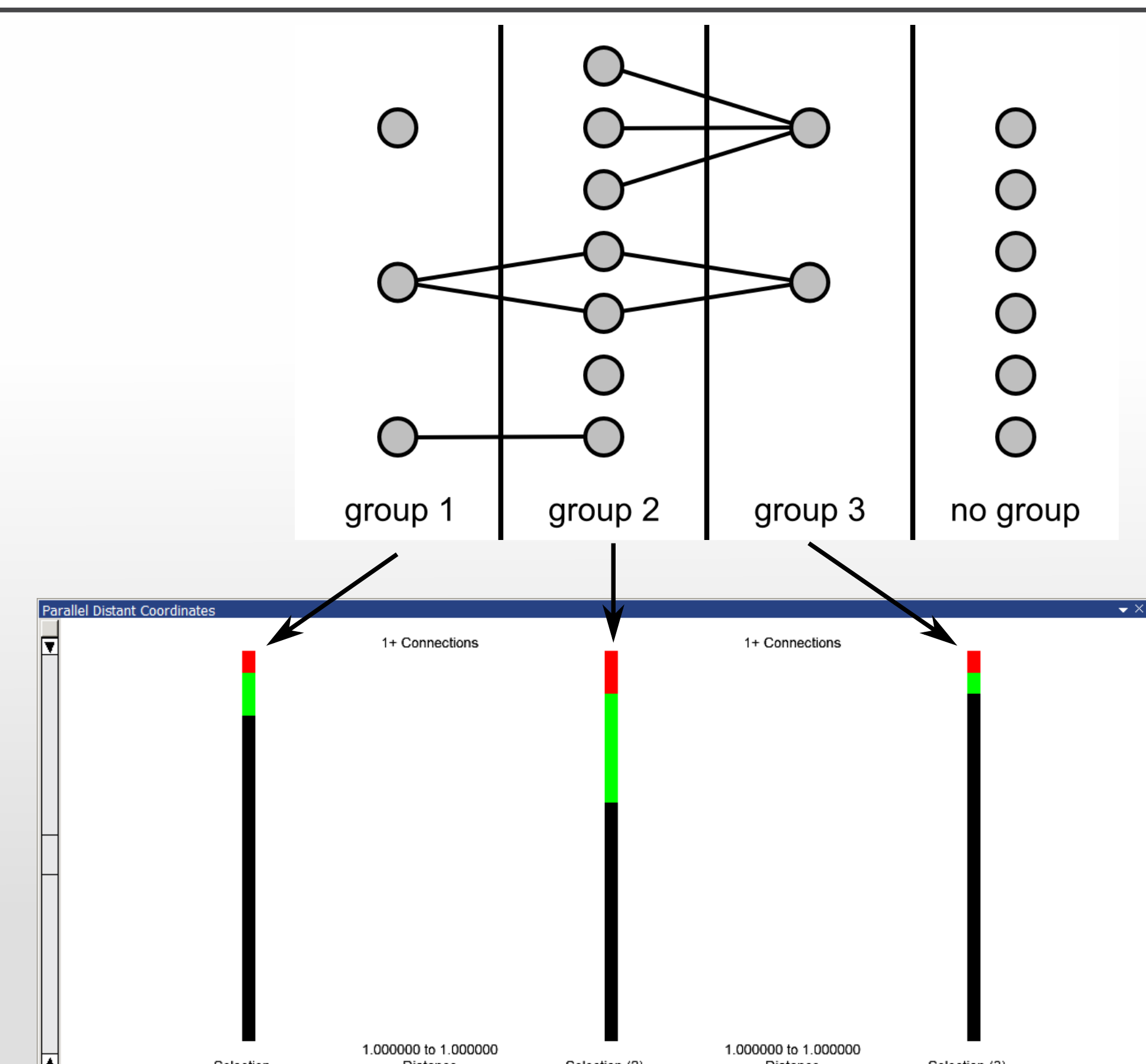
A node-link view complements the node data centered views and provides an overview of the structure of the network. The nodes in the view can be positioned either by conventional layouting methods or based on specific data dimensions of the nodes.

Nodes in the diagram can be correlated to the values displayed in other views by Linking & Brushing. To further focus on the selection, it is possible to display only the selected nodes or modify their layout.

Find complex structures

A novel visualization can be used for searching nodes that form a specific structure. Users define a set of possible nodes for each node of the structure and the view displays how many nodes fit the structure..

All nodes of the set that match the structure are found and the possible matches for each node of the structure can be inspected separately.



Searching for a structure consisting of a node in group 1 connected to a node in group 2 connected to a node in group 3

Contact and Cooperationpartner

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