Exercise 3 – Selbstorganisierende Systeme

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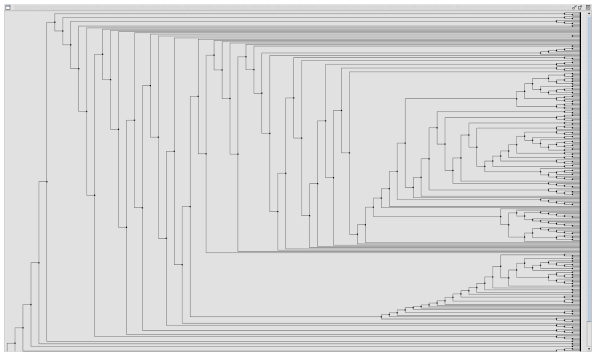
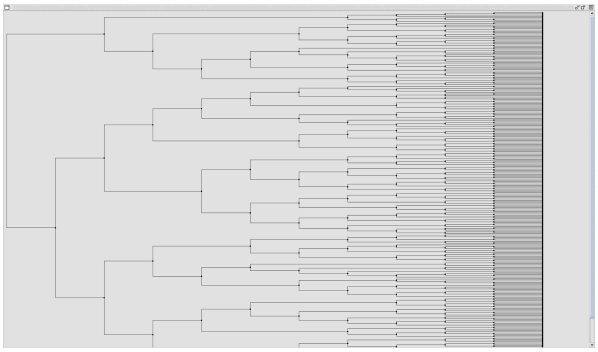
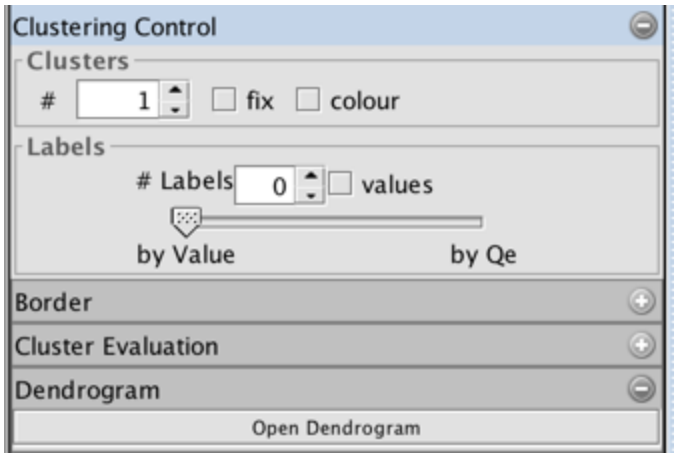
Dendrogram Visualization of Hierarchical Clustering Methods

Our implementation adds a window to the SOMViewer application of the SOMToolbox that is displayed after performing cluster analysis on the current SOM and shows the generated hierarchical cluster tree as a dendrogram.

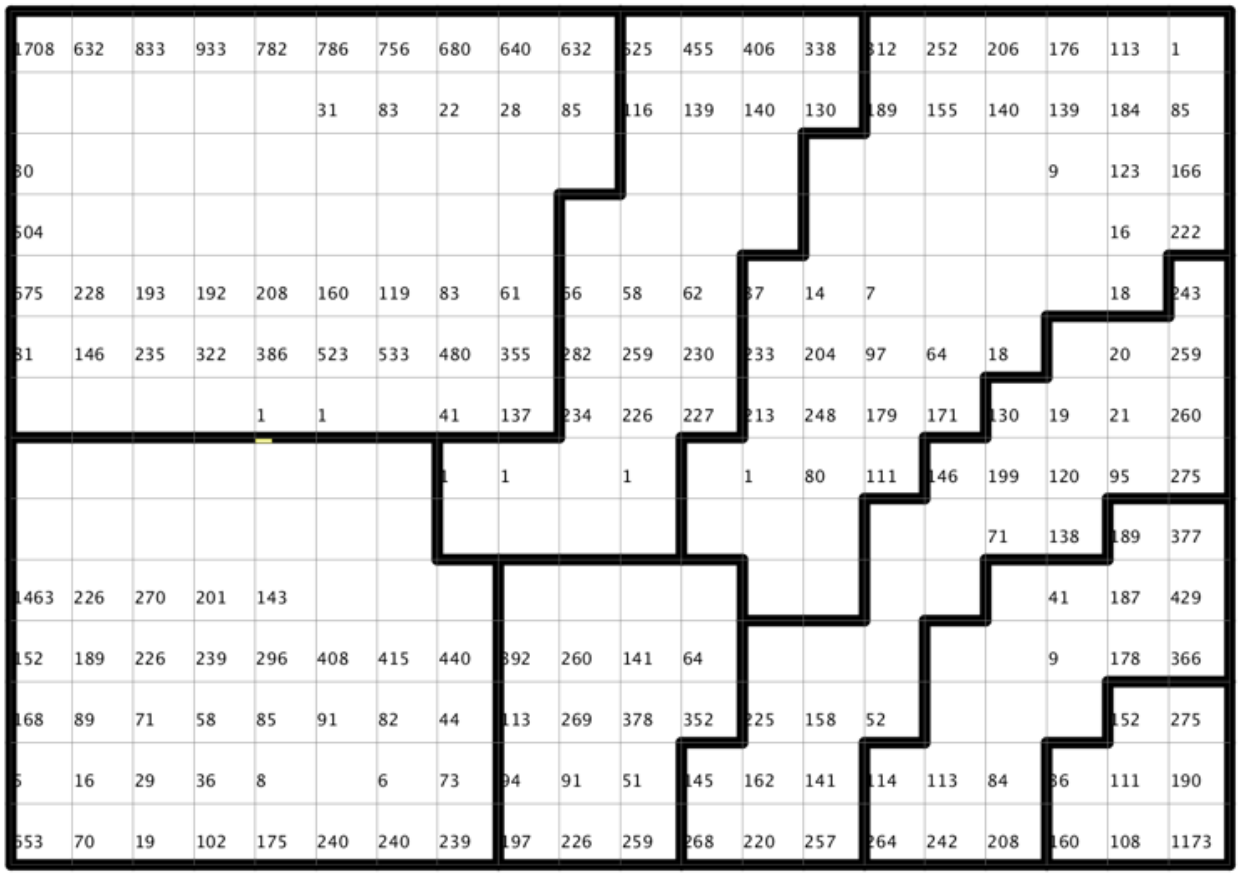
Single Linkage	Ward's Linkage
	

Two dendrograms created from the same SOM using different cluster analysis algorithms

The dendrogram window is opened immediately upon completion of the cluster detection algorithm. It can be closed and reopened with a button added in the Clustering Control options menu.



In addition to displaying a hierarchical rendering of all identified clusters, the dendrogram also offers an interactive method to select the number of clusters to be displayed in the main SOMViewer window. By clicking various points along the x-axis of the dendrogram, the user can select the number of clusters outlined in the SOM, analogous to the Clusters selector in the Clustering Control panel.



Clusters shown after clicking on the fourth level of the Ward's Linkage Dendrogram above

This addition to the SOMToolbox provides an intuitive way to select clusters to be rendered on a given SOM and gives the user a visual indication about the hierarchy of the clusters to be displayed.

Implementation Details

The addition of this tool required only minor changes to two existing classes in the SOMToolbox framework as well as the addition of a new class for the rendering of the dendrograms. No new dependencies were introduced to the project for its implementation. Dendrogram are drawn using the Java Abstract Windowing Toolkit (AWT) and displayed within a Swing JFrame.

Modified files:

- /src/core/at/tuwien/ifs/somtoolbox/apps/viewer/controls/ClusteringControl.java
- /src/core/at/tuwien/ifs/somtoolbox/visualization/clustering/ClusteringTree.java

New file:

- /src/core/at/tuwien/ifs/somtoolbox/visualization/clustering/Dendrogram.java

The corresponding file diffs and new source file are provided as part of the submission package.