

Exercise 4 – Advanced Topics in HCI (MMI 2)

Information Visualization

1. Tree Map Visualization (10 Points – June 23rd 2008):

Write a Java application which loads GraphML files and visualizes the graph as a tree map. The size of the area should be as large as the number of nodes in the subtree in relation to the overall number of nodes.

A tree map visualizes a tree by representing each node by an area. If a node contains subnodes, its area is divided into subareas. A summary of existing tree map visualizations and more information can be found at:

- <http://www.b-eye-network.com/view/2673>
- <ftp://ftp.cs.umd.edu/pub/hcil/Reports-Abstracts-Bibliography/2001-06html/2001-06.pdf>

For the representation of the graphs, GraphML (Graph Markup Language, <http://graphml.graphdrawing.org/>) is used. GraphML is an XML-based format which describes a graph by nodes and edges. Each edge connects two nodes. Here is an example of GraphML:

```
<node id="n0" />
<node id="n1" />
<edge id="ne" source="n0" target="n1" />
```

For processing GraphML graphs use the *gravisto Graph Visualization Toolkit* (<http://www.gravisto.org/>) . It supports loading GraphML files and provides Java classes representing the nodes and edges. For loading a GraphML file, create a new GraphMLReader and a new graph (adjacent) and load the file as follows:

```
Graph graph = new AdjListGraph();
try {
    xmlReader.read(filename, graph);
} catch (Exception e) {
    ...
}
```

You get the first node of the graph (*root* node) with:

```
root = (Node) graph.getNodes().get(0);
```

Important methods of the class `Node` are:

```
// returns neighbours connected by outgoing edges:  
public Collection getOutNeighbours() {...}  
// returns the number of outgoing (or undirected) edges  
public int getOutDegree() {...}
```

On the exercise website you can find a template (written by Paul Holleis) for your Java class (*TreeMapTemplate.java*), four example tree files (*tree0x.xml*) and the *gravisto.jar* library file.

Submit a *.zip file, that contains the *.java and *.class files. Send this file to sebastian.boring@ifi.lmu.de by **Monday, June 23rd 2008 11:59 a.m.**