SugiBib

Holger Eichelberger

Würzburg University, `eichelberger@informatik.uni-wuerzburg.de`

1 Short Description

UML (Unified Modeling Language) class diagrams, which are widely used for specifying aspects of object-oriented software systems, can be laid out by our tool SugiBib. In 1998 J. Seemann described how to apply the Sugiyama algorithm to class diagrams and the first version of SugiBib was implemented as a masters thesis.

2 Areas of Application

SugiBib can be used as a class browser, an online rendering engine and as a plugin layout component for external programs in order to calculate the layout of UML class diagrams specified as UMLscript [1] files.

3 Layout Algorithms and Layout Features

The algorithm identifies the edges of a pseudo-hierarchy (usually the inheritance edges), calculates a semantic ordering, inserts compound nodes due to incremental layout, association classes and annotations, inserts additional edges to reflect containment of nodes and removes reflective associations. Then the algorithm by Seemann is applied and after the calculation of coordinates all composite nodes inserted in the preparation steps are expanded. Nested nodes are currently laid out by a frame layout approach which is applied to the entire input graph.

4 Architecture

SugiBib is a framework which was designed to implement a general, highly configurable, component-based version of the Sugiyama algorithm [3]. The components can be combined in different sequences to implement other layout algorithms. Nodes and edges of the framework are parametrized by their individual graphical information.

4.1 Programming Language

SugiBib is a pure Java framework which can be compiled and executed on all Java 2 platforms. The graphical frontend is implemented in AWT and in Swing. The current implementation is tested on the JDK version 1.3.1
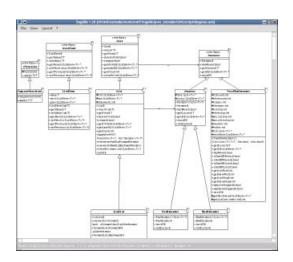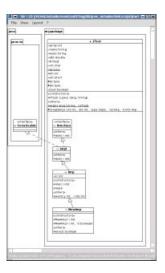
4.2   Operating System

Since SugiBib is written in Java, it runs on every platform that supportes by Java.

5   Interfaces

As a framework SugiBib represents an open interface. New components are be implemented by subclassing existing classes. Components are used in sequence, i.e. a component is called by its constructor and its input is the preceeding component itself. Further implementations will provide XMI (XML Metadata Interchange) and GXL (Graph Exchange Language) beside UMLscript[1] as input languages. Graph descriptions in UMLscript can be generated from Java source code by an appropriate compiler.

6   Screenshots

References

1. H. Eichelberger, J. Wolff von Gudenberg: UMLscript Sprachspezifikation, Technical Report No. 272, University of Wuerzburg, February 2001
2. J. Seemann: Extending the Sugiyama Algorithm for Drawing UML Class Diagrams: Towards Automatic Layout of Object-Oriented Software Diagrams, *Lecture Notes in Computer Science*, LNCS 1353 G. DiBattista (Editor), 414-423, 1998
3. K. Sugiyama, S. Tagawa, M. Toda: Methods for Visual Understanding of Hierarchical System Structures, *IEEE Transactions on Systems, Man, and Cybernetics*, SMC-11(2):109-125, February 1981