

yFiles: Visualization and Automatic Layout of Graphs

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1 Short Description

yFiles is a Java-based library for the visualization and automatic layout of graph structures. Included features are data structures, graph algorithms, diverse layout and labeling algorithms and a graph viewer component.

The graph viewer architecture adheres to the model-view-control design pattern. The view component itself is a Java-Swing based component that can easily be added to any application GUI. It supports features like zooming, scrolling, layout morphing and different levels of detail rendering.

yFiles was designed to be easily integratable into any Java-based application that either needs a viewer component or layout algorithms for graph structures or both.

By now, *yFiles* is a commercial product distributed by yWorks GmbH. An evaluation version of *yFiles* can be obtained from the authors or the yWorks web page www.yWorks.de.

2 Areas of Application

An extensive and liable visualization system is crucial in application areas such as software engineering, database management and database modelling, WWW-visualization, bioinformatics, business process engineering and networking. *yFiles* has been successfully employed to all of these domains and, thus, has already proved its high flexibility and usefulness.

3 Layout Algorithms and Layout Features

Currently *yFiles* includes graph layout algorithms for the following styles: layered, tree, force-directed, circular-radial and orthogonal. These algorithms are tuned variants of published algorithms.

Besides layout algorithms which assign coordinates to edge paths and nodes, *yFiles* also supports the automatic assignment of edge and node label coordinates.

Both layout and labeling algorithms can be customized to a high degree. Customization can be done by either setting layout parameters or by exchanging certain stages of an algorithm by custom code.

4 Architecture

4.1 Programming Language

yFiles is written in Java.

4.2 Operating System

The library runs on all Java2 platforms, currently including Linux, Solaris, HP/UX, MacOS X, and Microsoft Windows (95/98/2000/NT).

5 Interfaces

The main *yFiles* interface is provided at the Java application programming level. The API allows seamless integration of graph viewer and/or -layout components in any Java-based application.

Additional support for the widely used GML file format allows data exchange with non-Java applications and other graph drawing tools.

6 Screenshots

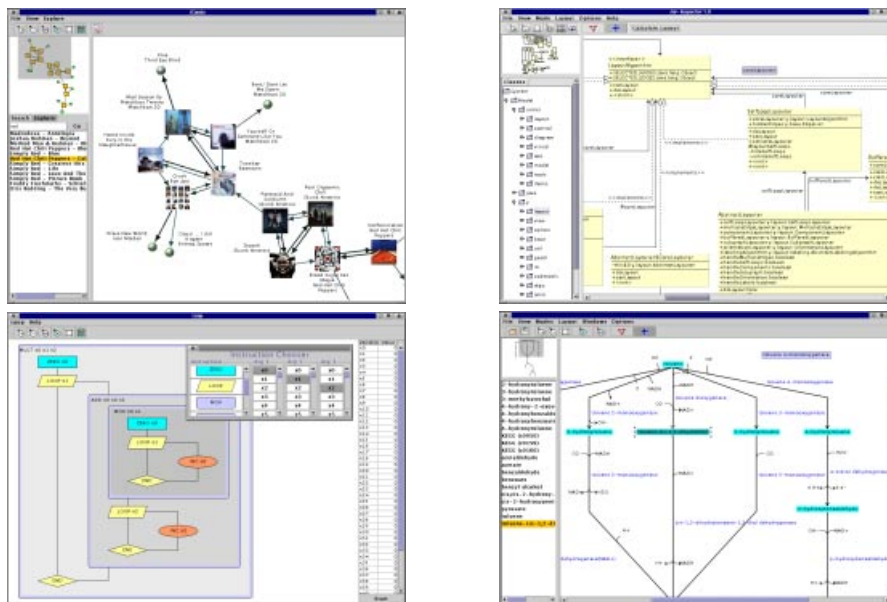


Fig. 1. Applications built upon *yFiles*: a product browser, a UML tool, a visual programming editor and a biochemical pathways browser.