visone[*]

Software for Visual Social Network Analysis[**]

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1 Short description

We are developing a social network tool that is powerful, comprehensive, and yet easy to use. The unique feature of our tool is the integration of network analysis and visualization. In a long-term interdisciplinary research collaboration, members of our group had implemented several prototypes to explore and demonstrate the feasibility of novel methods. These prototypes have been revised and combined into a stand-alone tool which will be extended regularly.

2 Areas of Application

Social network analysis is a subdiscipline of the social sciences using graph-theoretic concepts to understand and explain social structure. Its methods are also applied, e.g., to financial networks, citation networks, and Web graphs.

Over the last few years, interest in methods for visual analysis of social networks has risen substantially, and several novel approaches have been devised. In response to numerous requests, we are developing this software specifically to allow non-specialist users in the social sciences to apply innovative and advanced methods with ease and accuracy.

The tool is intended for research and teaching in social networks, with special emphasis on visual means of exploring and communicating network data and analyses. In contrast to other tools common in the social sciences, ours is entirely visual. Technicalities are either transparent, or expressed in simpler terms. Initial feedback indicates that users who often regard data exploration and analysis as complicated and unnerving enjoy the playful nature of visual interaction.[1]

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3 Layout Algorithms and Layout Features

A central line of research in social network analysis is the investigation of prominent actors in a social structure. All standard and several more specialized prominence indices are provided. They are implemented using novel algorithms and, due to our newly introduced normalization scheme, can easily be compared with each other. Future versions are likely to support also various forms of cluster analysis.

Two visualization methods specifically designed to convey the result of such prominence analyses (see screenshots below) are implemented using our own, recently improved algorithms. In addition, we provide a simple spring embedder, a modified spectral layout algorithm, and some simple layout adjustment routines. Future versions shall include, e.g., multidimensional scaling.

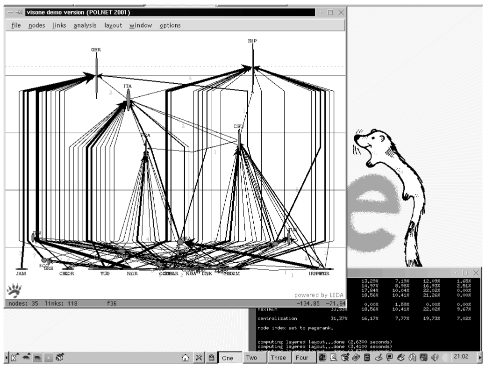
4 Architecture

The user interface of visone is a graphical editor tailored to social networks with specialized components for analysis and visualization. The editor uses terminology consistent with the social network literature, and provides different data views in a way that is intuitive for social network analysts.

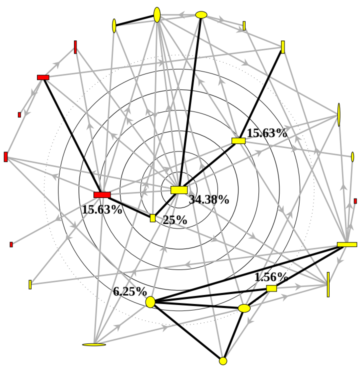
For interoperability, we support a number of data formats common in social network analysis. Publication quality export is available in PostScript and SVG (which can be converted into, e.g., PDF or JPEG). A batch mode is anticipated.

The program is written in C++, making extensive use of LEDA, the Library of Efficient Data Types and Algorithms from Algorithmic Solutions GmbH. It is available for systems running Linux, Solaris, or Windows, free of charge for academic purposes.

5 Screenshots



status visualization
(screenshot)



centrality visualization
(publication export)