Social Network Analysis

Tools

Introduction

- There are many tools available for Visualization and SNA.
- Many tools can be used to calculate graph metrics
  - Many have features supporting Social Network Analysis
- Two Types:
  - Systems providing visualizations
  - Toolkits that can be used to build systems
- Some are Commercial systems (Many have free basic versions)

Systems providing visualizations

- **Pajek**
- **Gephi**
- **NodeXL**
- **TouchGraph**

- *Many more!*

Gephi

http://gephi.org

Gephi
makes graphs handy

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The Open Graph Viz Platform

Gephi is a visualization and exploration platform for all kinds of networks and complex systems, dynamic and hierarchical graphs.

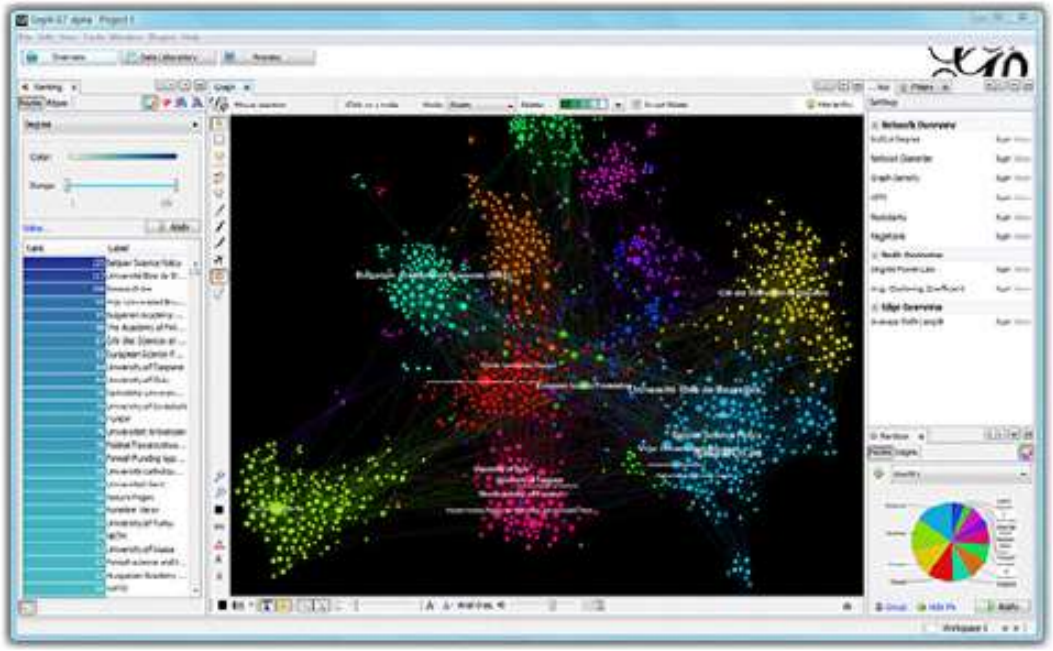
Runs on Windows, Linux and Mac OS X. Gephi is open-source and free.

Learn More on Gephi Platform »

Download FREE
Gephi 0.7 alpha

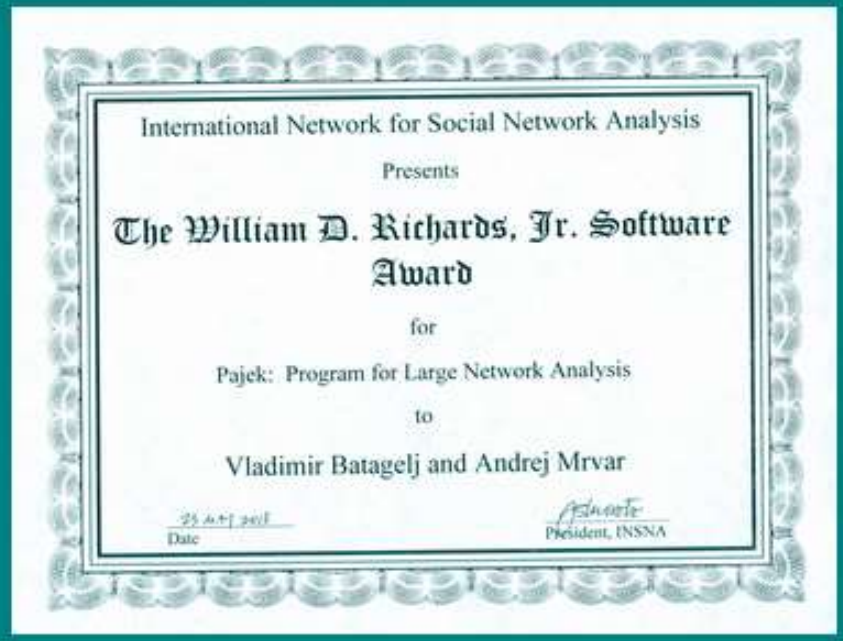
Release Notes | System Requirements

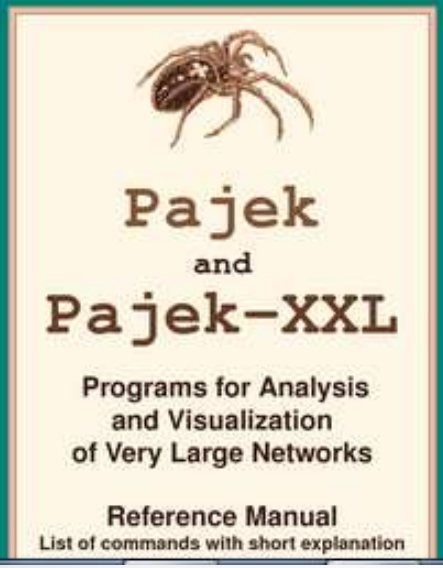
- Features
- Quick start
- Screenshots
- Videos

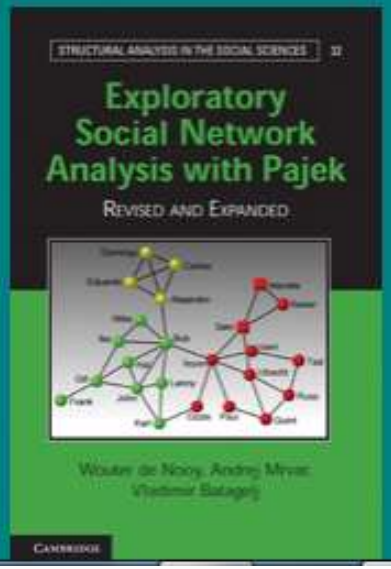


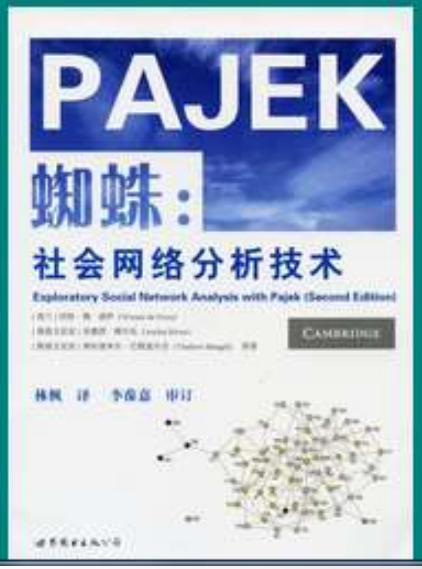
Pajek / Pajek-XXL versions 3.** and 4.**

Download - January 7, 2016	32 bit	64 bit
January 7, 2016	4.08	4.08
December 1, 2015	4.07	4.07
September 25, 2011	2.05	2.05
Pajek mailing list	Datasets	





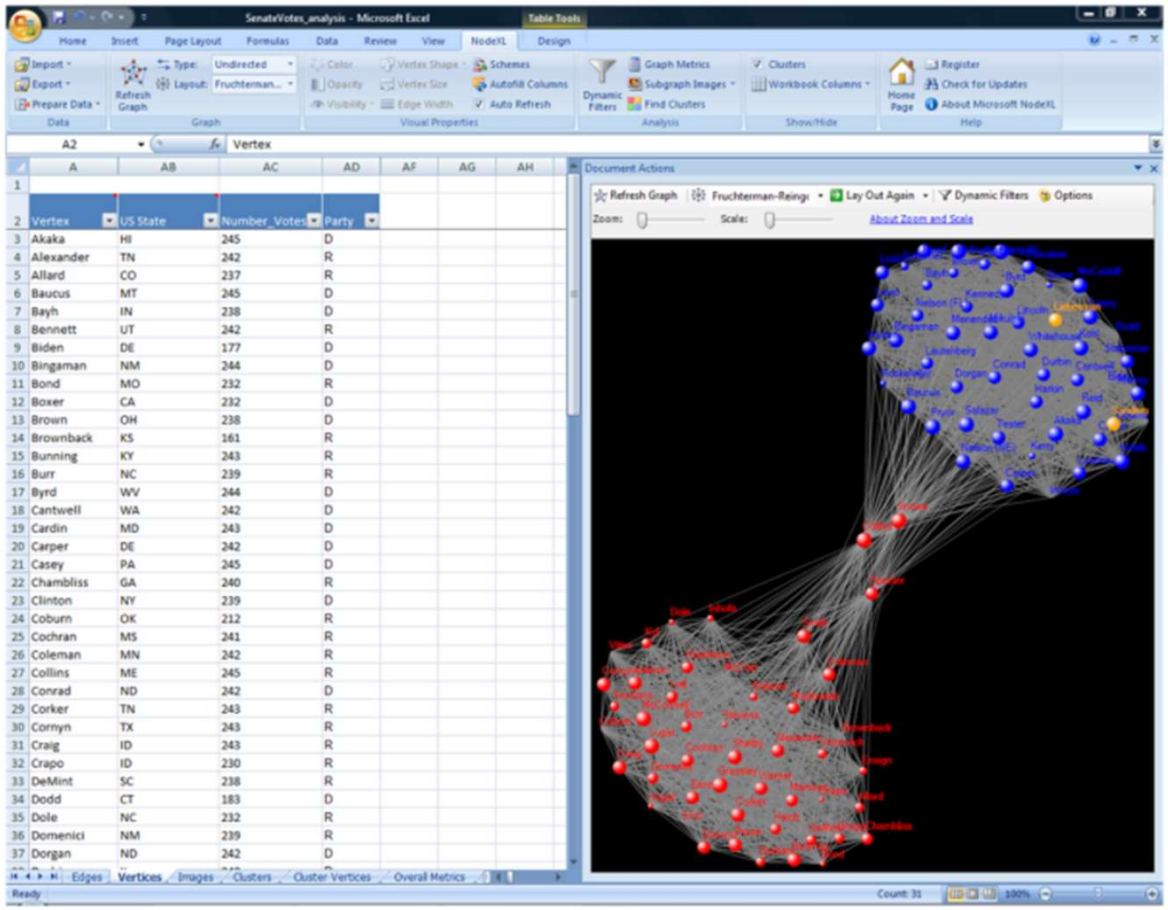




NodeXL

NodeXL is a powerful and easy-to-use interactive network visualisation and analysis tool that leverages the widely available MS Excel application as the platform for representing generic graph data, performing advanced network analysis and visual exploration of networks. The tool supports multiple social network data providers that import graph data (nodes and edge lists) into the Excel spreadsheet.

The tool includes an Excel template for easy manipulation of graph data:



https://www.microsoft.com/en-us/research/project/nodexl-network-overview-discovery-and-exploration-in-excel/

TouchGraph

- *TouchGraph* allows for the creation and navigation of ineractive graphs.
- Commercial system
  - http://www.touchgraph.com
- Older free system for a set of interfaces for graph visualization using force-based layout and focus+context techniques
  - http://sourceforge.net/projects/touchgraph/

Toolkits & Infrastructures

- Set of components or capabilities that allow others to put together visualization systems
- Coherent software architecture and set of programming components
- Views: time series, parallel coordinates, scatterplots, node-link diagrams, treemaps
- Added capabilities in color management, labeling, dynamic queries, …
- Capabilities to calculate metrics (example, Social Network metrics)
- Advantage: Much more control
- Disadvantage: Learning curve

Toolkits & Infrastructures

- **Cytoscape** (Java)
- **D3** (Javascript)
- **SNAP** (C++)
- **Network X** (Python)
- **Neo4J**

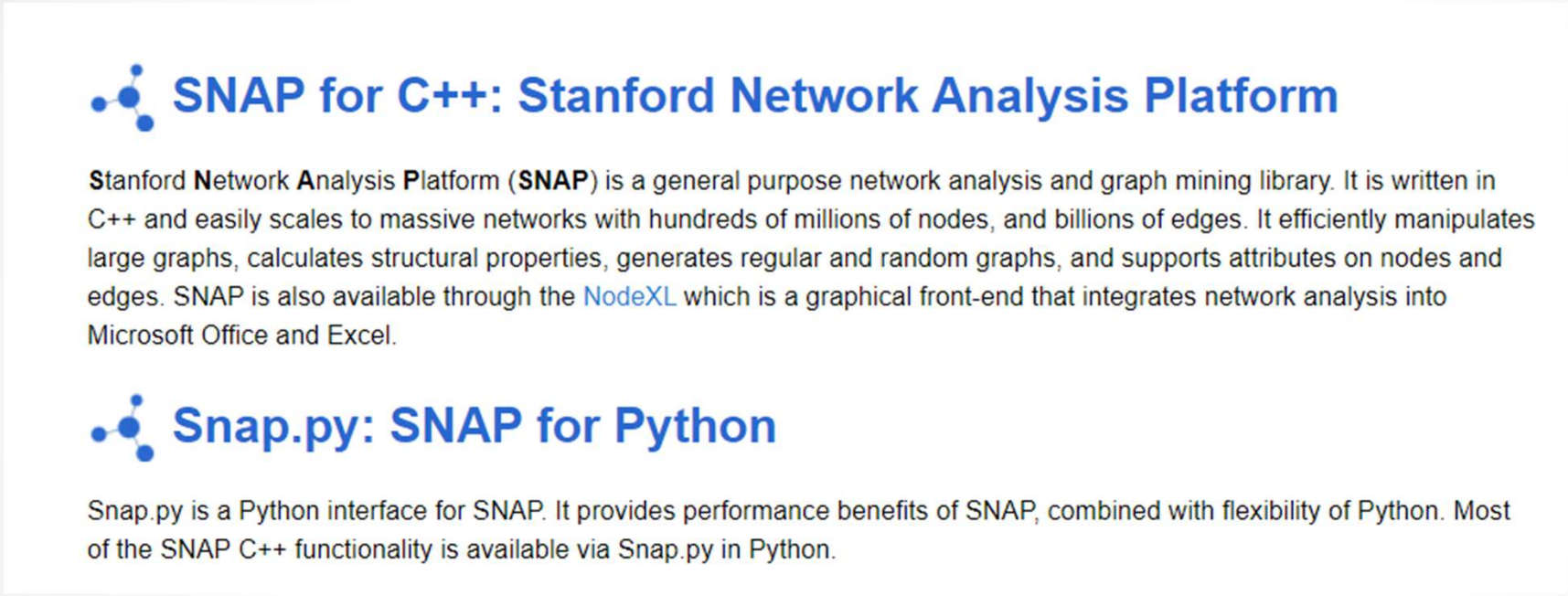
Cytoscape

- ***Cytoscape*** is an open source software platform for ***visualizing*** molecular interaction networks and biological pathways and ***integrating*** these networks with annotations, gene expression profiles and other state data.
- Although Cytoscape was originally designed for biological research, now it is a general platform for complex network analysis and visualization.
- Cytoscape *core* distribution provides a basic set of features for data integration, analysis, and visualization.
- Additional features are available as ***Apps*** (formerly called *Plugins*).
  - Apps are available for network and molecular profiling analyses, new layouts, additional file format support, scripting, and connection with databases.
- They may be developed by anyone using the Cytoscape open API based on Java™ technology
- http://www.cytoscape.org/

D3: Data Driven Documents

- **D3.js** is a JavaScript library for manipulating documents based on data.
- **D3** helps you bring data to life using HTML, SVG, and CSS.
- D3's emphasis on web standards gives you the full capabilities of modern browsers without tying yourself to a proprietary framework, combining powerful visualization components and a data-driven approach to DOM manipulation.
- "Not just an infovis toolkit"
- http://d3js.org/

SNAP



http://snap.stanford.edu/

NetworkX

Network Analysis in Python

NetworkX is a Python package for the creation, manipulation, and study of the structure, dynamics, and functions of complex networks.

Software for complex networks

- Data structures for graphs, digraphs, and multigraphs
- Many standard graph algorithms
- Network structure and analysis measures
- Generators for classic graphs, random graphs, and synthetic networks
- Nodes can be "anything" (e.g., text, images, XML records)
- Edges can hold arbitrary data (e.g., weights, time-series)
- Open source 3-clause BSD license
- Well tested with over 90% code coverage
- Additional benefits from Python include fast prototyping, easy to teach, and multi-platform

https://networkx.org/

Neo4J

- **Native Database for Graphs**
- **Graph analytics**
- **Visualization**
- https://neo4j.com/

Disclaimer

- There are many other tools and packages
- New tools are being developed