Pajek

Tool presentation

Introduction

- Developed by V. Batagelj and A. Mrvar
  - Department of Mathematics, Faculty of mathematics and physics, University of Ljubljana

- Software tool for **network** analysis:
  - Social networks
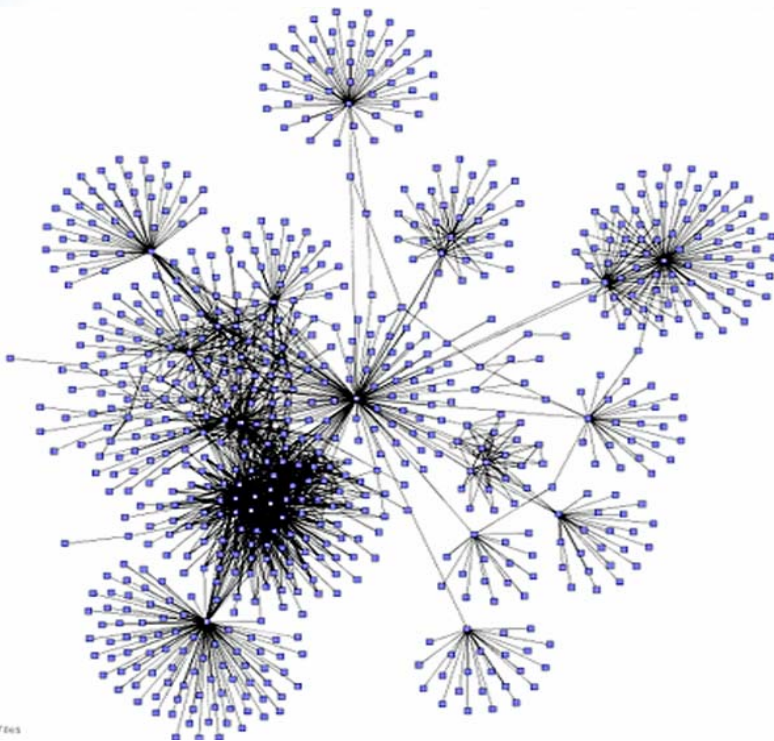 - World wide web
  - Other networks

Social network analysis

- Main goal is *detecting* and *interpreting* patterns of social ties among actors
  - Cohesion: measures of cohesion
  - Brokerage: centrality, bridges
  - Ranking
  - Etc.

- De Nooy, Mrvar, Batagelj: *Exploratory Social Network Analysis with Pajek*
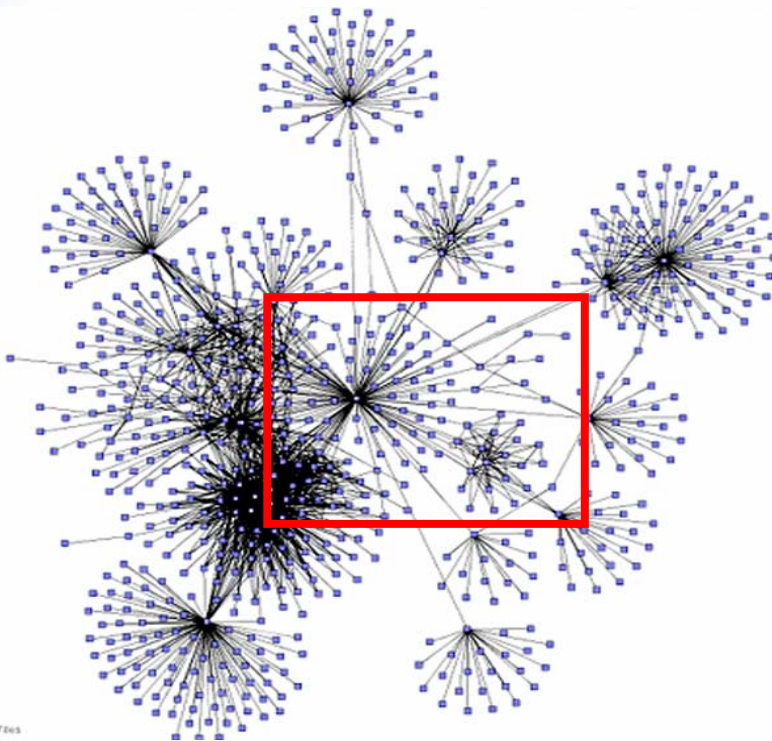
Example

Network of emails

- node: person
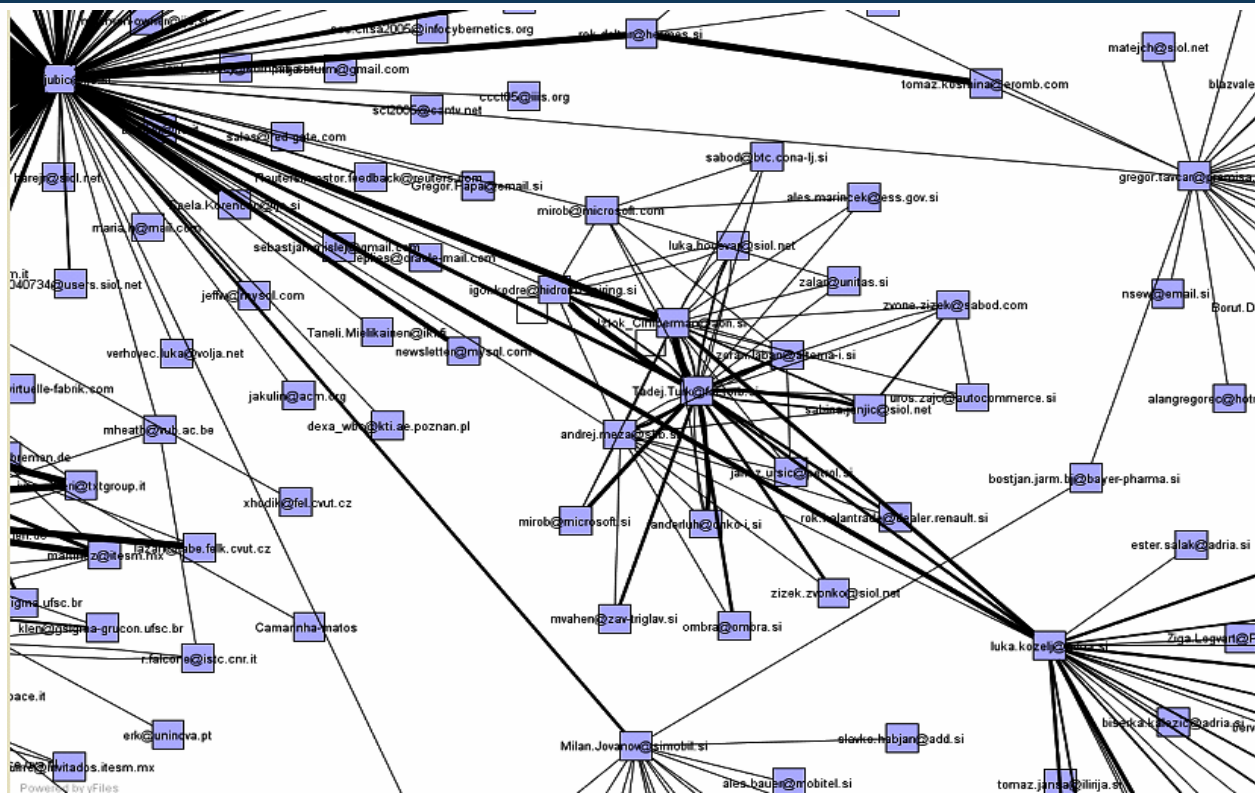
- edge: sent email

- edge thickness: number of emails

Example

Network of emails

- node: person

- edge: sent email

- edge thickness:
  number of emails

Example

Other examples

- Trade ties between countries

- Football player transfers between countries

- Web site popularity

- Interlocking directorates (who sits on boards of several companies)

- Etc.

Running Pajek

- Runs on Windows platforms (also on Linux with `wine` emulator)
- Download tool from website:
  - http://vlado.fmf.uni-lj.si/pub/networks/pajek/
  - http://vlado.fmf.uni-lj.si/pub/networks/book/
  - Tool
  - Documentation
  - Examples (datasets, graphs etc.)
- Download and run `pajek117.exe` or `pajek.be.exe` (book edition)

Data preparation

- Input is network consisted of set of:
  - Vertices
  - Arcs (directed edges)
  - Edges (undirected edges)
- Example in *.net format
- There are some other formats we will not use

Input example

```
*Vertices 3
1 "Doc1" 0.0 0.0 0.0 ic Green bc Brown
2 "Doc2" 0.0 0.0 0.0 ic Green bc Brown
3 "Doc3" 0.0 0.0 0.0 ic Green bc Brown
*Arcs
1 2 3 c Green
2 3 5 c Black
*Edges
1 3 4 c Green
```
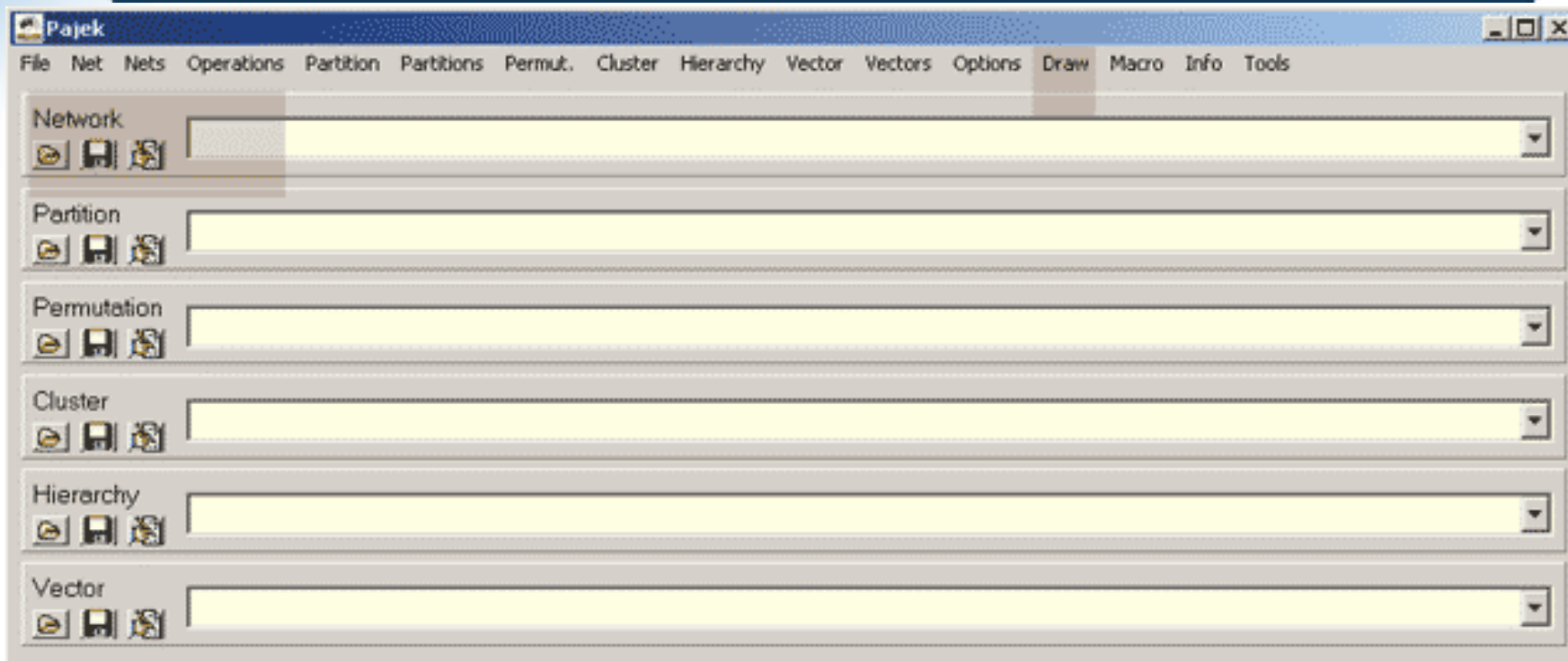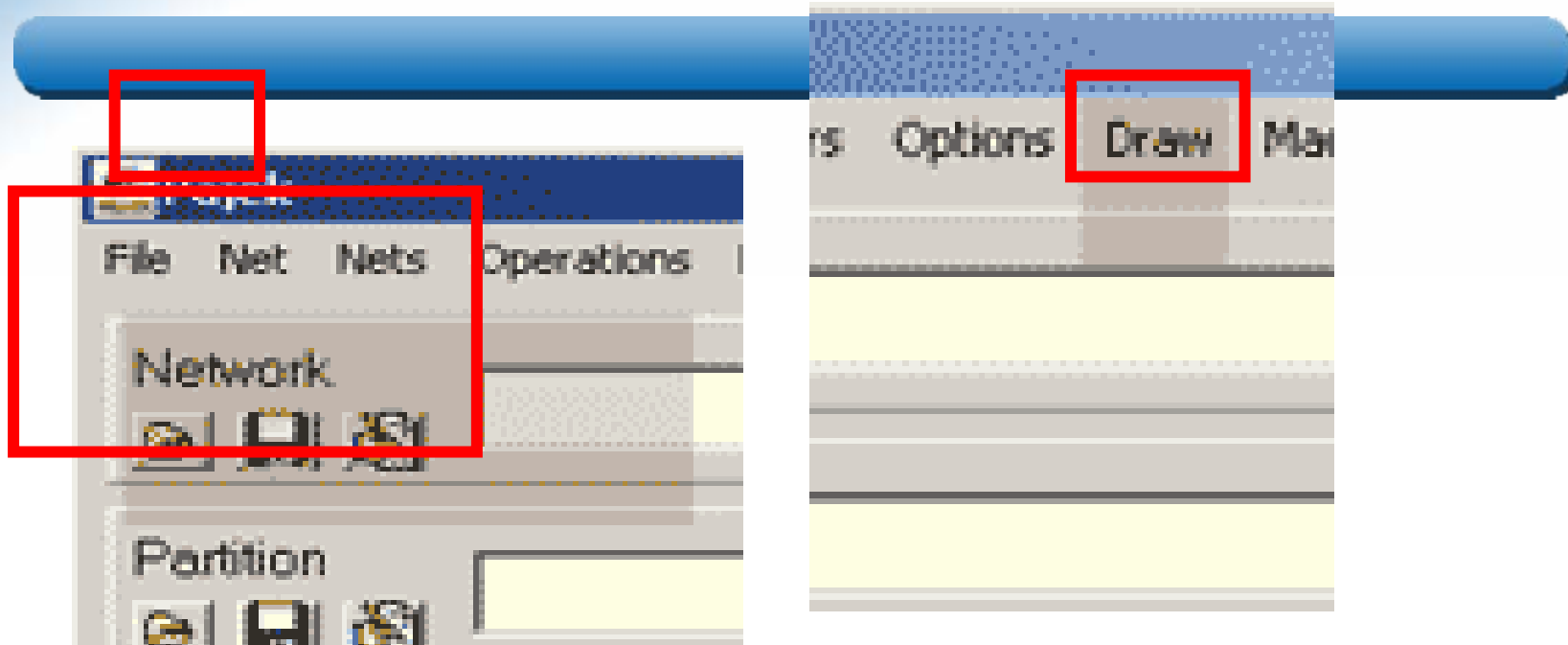
Pajek layout
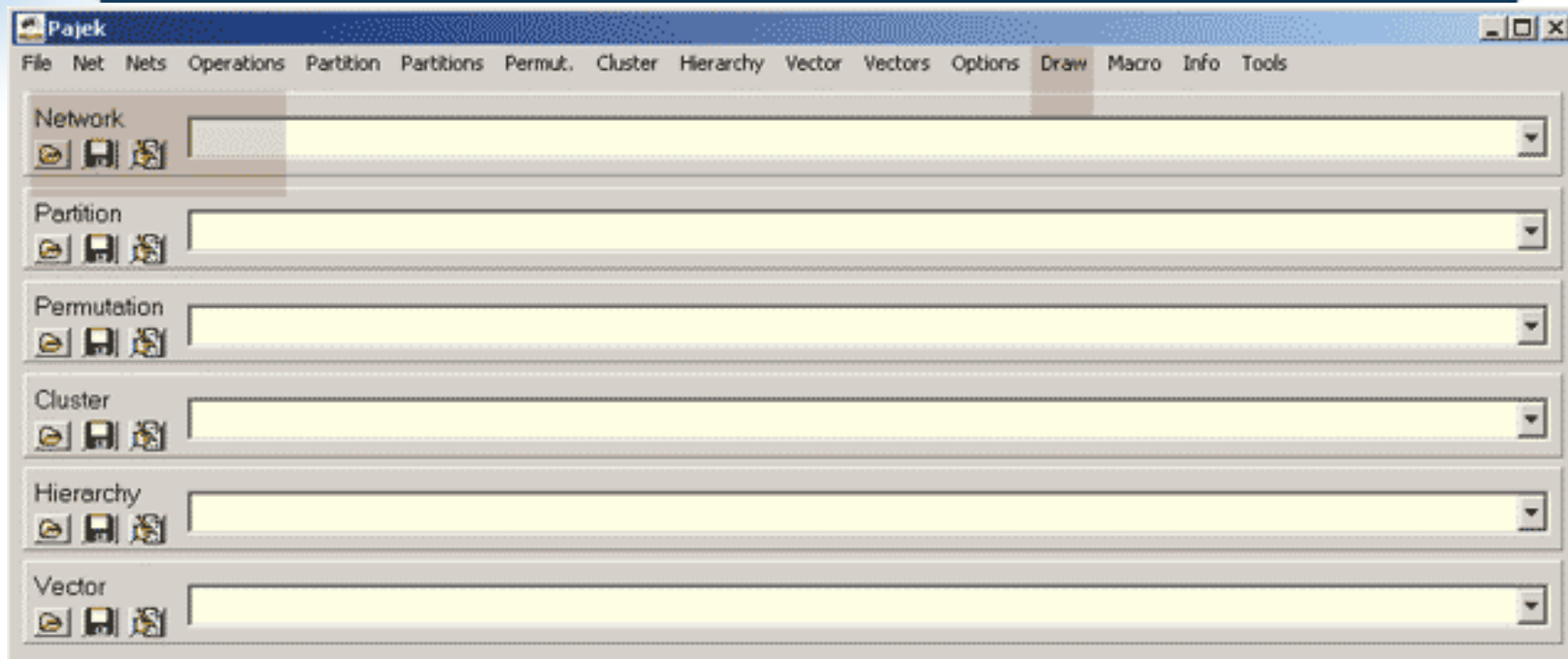
Basic Pajek concepts

- **Network** is set of vertices, arcs and edges
- **Partition** of network – classification of the vertices, such that each vertex is assigned to exactly one class
- **Permutation** of a network is a renumbering of its vertices
- **Vector** assigns a numerical value to each vertex in the network

Pajek layout

Starting points

Lost?
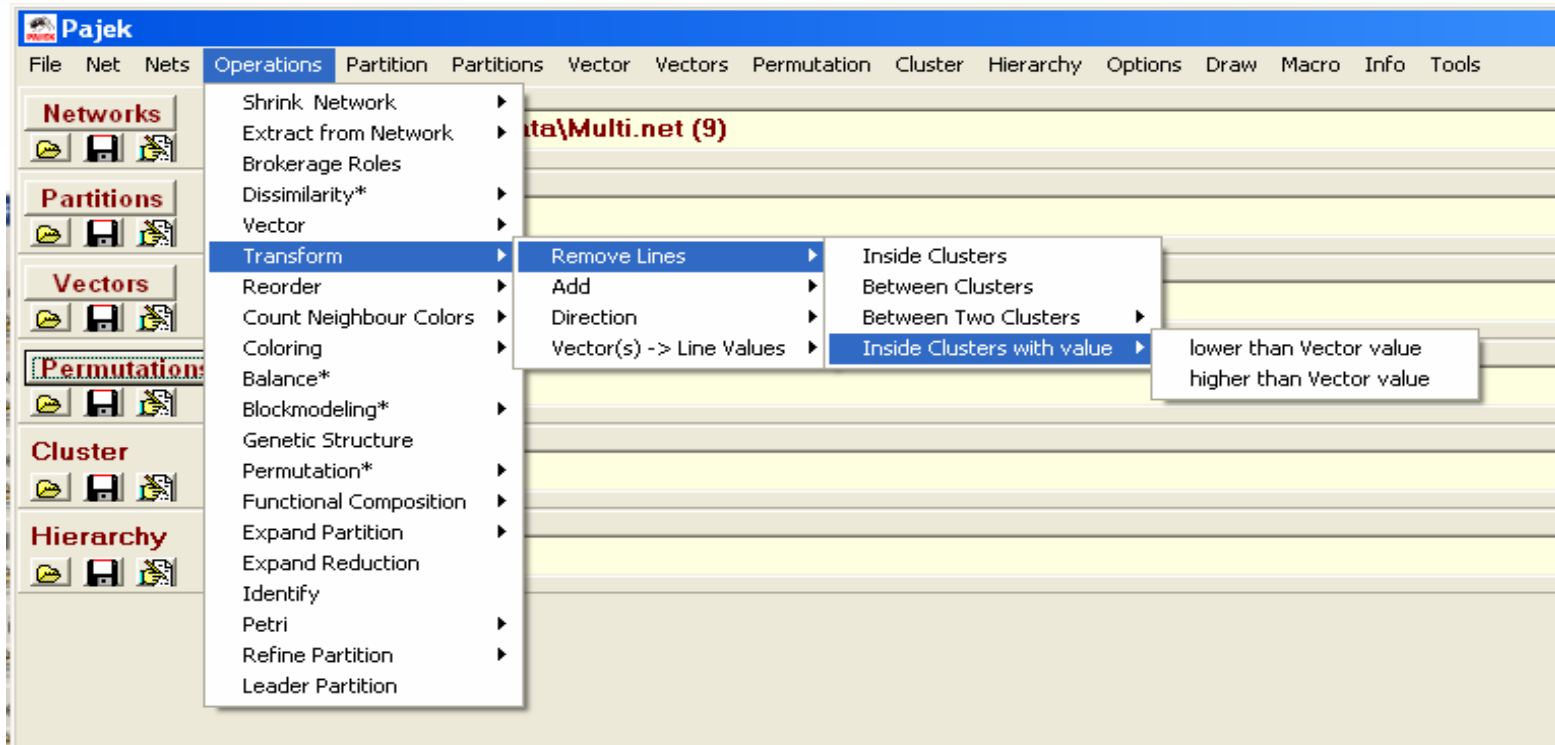
Get familiar with Pajek

- Download and install software
- Download and try some examples
- Try some visualizations, layouts
- Get comfortable with data preparation (typing, Excel, sql, xslt, ?)

Some other links

Pajek:

● http://iv.slis.indiana.edu/lm/lm-pajek.html

Social Network Analysis:

● http://en.wikipedia.org/wiki/Social_network

Network Visualization:

● http://www.visualcomplexity.com/vc/
● http://www.yworks.com/en/products_yed_about.htm

The task

ILPnet2

What is ILPnet2

- Network of Excellence in Inductive Logic Programming (1998-2002)
- Consisting of 37 universities and research institutes
- Successor of ILPnet (1993-1996)
- http://www.cs.bris.ac.uk/~ILPnet2/
- Focus on ILPnet2 library

Setting

- Library consists of papers and books
- The papers and the books were written by people
- Authors collaborate
- Library covers different topics within ILP
- Topics and collaborations evolve with time

Problem

- You walk through the door into an ILP world and some questions rise?

    - Who are the most important authors in the area?

    - Which topic is hot, which is not?

    - Are there any closed groups of authors?

    - Is there any person among most of these groups?

    - Is this the same person also very important?

Problem

- Is there hierarchy of topics?
- What were the glory days of some topics?
- Who switched the most topics?

- Three aspects (can be combined)
  - Social
  - Content
  - Time

The data

The ILPnet2 on-line library

Welcome to the on-line library of ILPnet2. This library contains ILP-related references from 1970 onwards. It is based on the ILP-bibliography over 1970-1996 that was compiled by ILPnet. A number of references over 1997 and 1998 were added courtesy of the ILP2 project. This live web-database was constructed from those bibtex files and is maintained by ILPnet2. It currently contains more than 1,000 entries by well over 500 different authors. Many, more recent entries include an abstract and a link to an on-line version of the paper. Thanks are due to Henk Muller for providing the necessary software, and to Elias Gyftodimos for maintenance.

> We are currently working on a new version of the library with added functionality.
> This new version will then be extended with post-2003 references.
> Watch this space!

You can access the library by

- Author
- Keyword
- Type of publication
- Year: 2003; 2002; 2001; 2000; 1999; 1998; 1997; 1996; 1995; 1994; 1993; 1992; 1991; 1990; 1989; 1988; 1987; 1986; 1984; 1983; 1981; 1980; 1971; 1970;

BibTeX downloads

- complete BibTeX file
- Gzipped BibTeX
- strings used in BibTeX file

The data – authors (482)

The data – keywords (31)

The data – publications (?)

The data - publication

The data – external

Additional information about collaboration
and reputation can be obtained from:

- Google Scholar (http://scholar.google.com)
- Citeseer (http://http://citeseer.ist.psu.edu/)
- Web of Science (http://wos.izum.si)