

Analyzing the network structure and gender differences of the “NKOS community”

Philipp Mayr

GESIS – Leibniz Institute for the Social Sciences
2018-09-13, Porto, Portugal



```
@article{kari2018,
  title = {Analyzing the network structure and gender differences among the members of the Networked Knowledge Organization Systems (NKOS) community},
  url = {http://arxiv.org/abs/1803.04225},
  doi = {10.1007/s00799-018-0243-0},
  journal = {International Journal on Digital Libraries},
  author = {Karimi, Fariba and Mayr, Philipp and Momeni, Fakhri},
  year = {2018}}
```

Motivation

- European NKOS network has held a **long-running series** of annual workshops at ECDL & TPDL
- NKOS research output has **never** been subject to analysis
 - Esp. the (**informal**) research output of the NKOS community
- Most workshop output has never published as formal publications
 - Except 4 special issues (2* J. Dig. Inf., New Rev. Hypermed. Multimed, Int. J. Dig. Libr.)

NKOS Workshops - (Networked Knowledge Organization Systems and Services)

As part of the activities of the NKOS (Networked Knowledge Organization Systems and Services) network, Doug Tudhope has co-organised the European NKOS Workshops:

- 2000 – at ECDL (European Conference on Digital Libraries), Lisbon, Portugal.
- 2003 – at ECDL, Trondheim, Norway.
- 2004 – at ECDL, Bath, England.
- 2005 – at ECDL, Vienna, Austria.
- 2006 – at ECDL, Alicante, Spain.
- 2007 – at ECDL, Budapest, Hungary.
- 2008 – at ECDL, Aarhus, Denmark.
- 2009 – at ECDL, Corfu, Greece.
- 2010 – at ECDL, Glasgow, Scotland.
- 2011 – at (renamed) TPDL (Theory and Practice of Digital Libraries), Berlin, Germany.
- 2012 – at TPDL, Paphos, Cyprus.
- 2013 – at TPDL, Valletta, Malta.
- 2014 – at joint TPDL & JCCL, London, UK.
- 2015 – at TPDL, Poznań, Poland.
- 2016 – at TPDL, Hannover, Germany. [Proceedings](#)
- 2016 – at joint DC/ASIST, Copenhagen, Denmark.
- 2017 – at TPDL, Thessaloniki, Greece. [Proceedings](#)
- 2018 – at TPDL/DCMI joint conference, Porto, Portugal

<http://hypermedia.research.southwales.ac.uk/kos/nkos/>

<http://nkos.slis.kent.edu/>

NKOS workshop bibliography

- We checked all workshop published agendas and compiled a bibliography of past NKOS workshops (2000-2016)
- Manual author name disambiguation of each author entries
- The bibliographic data as bibtex files are available

<https://github.com/PhilippMayr/NKOS-bibliography>

The screenshot shows the GitHub repository page for 'PhilippMayr / NKOS-bibliography'. At the top, there are navigation options: 'Code', 'Issues 4', 'Pull requests 0', 'Projects 0', 'Wiki', 'Insights', and 'Settings'. Below this, the repository description reads 'Bibliographies of NKOS workshops and NKOS special issues as bibtex'. The repository statistics show 98 commits, 1 branch, 1 release, 4 contributors, and a CC0-1.0 license. A 'Clone or download' button is visible. The commit history table is as follows:

Commit Hash	Message	Time
7c8c3ce	frbkrm Add files via upload	Latest commit on 29 Mar
	bibtex tpd12017	7 months ago
	publications Add files via upload	6 months ago
	.gitattributes Added .gitattributes & .gitignore files	2 years ago
	.gitignore Added .gitattributes & .gitignore files	2 years ago
	LICENSE.txt Add LICENSE (#10) and extend Markdown README	2 years ago
	NKOSLogo.png minor changes	2 years ago

Dataset & Analysis

- First analysis for the 15th NKOS workshop at TPDL 2016 (**no US workshops**), see workshop paper <http://ceur-ws.org/Vol-1676/paper1.pdf>
 - For the follow-up IJDL paper we added **all US NKOS workshops and other scattered events**
- Dataset for the paper includes: **123 papers** with a sum of **256 distinct authors** (just co-authored papers)
- We describe the network with standard network analytic measures
 - Global properties
 - Centrality of the authors
 - Gender differences in collaboration behavior

The dataset

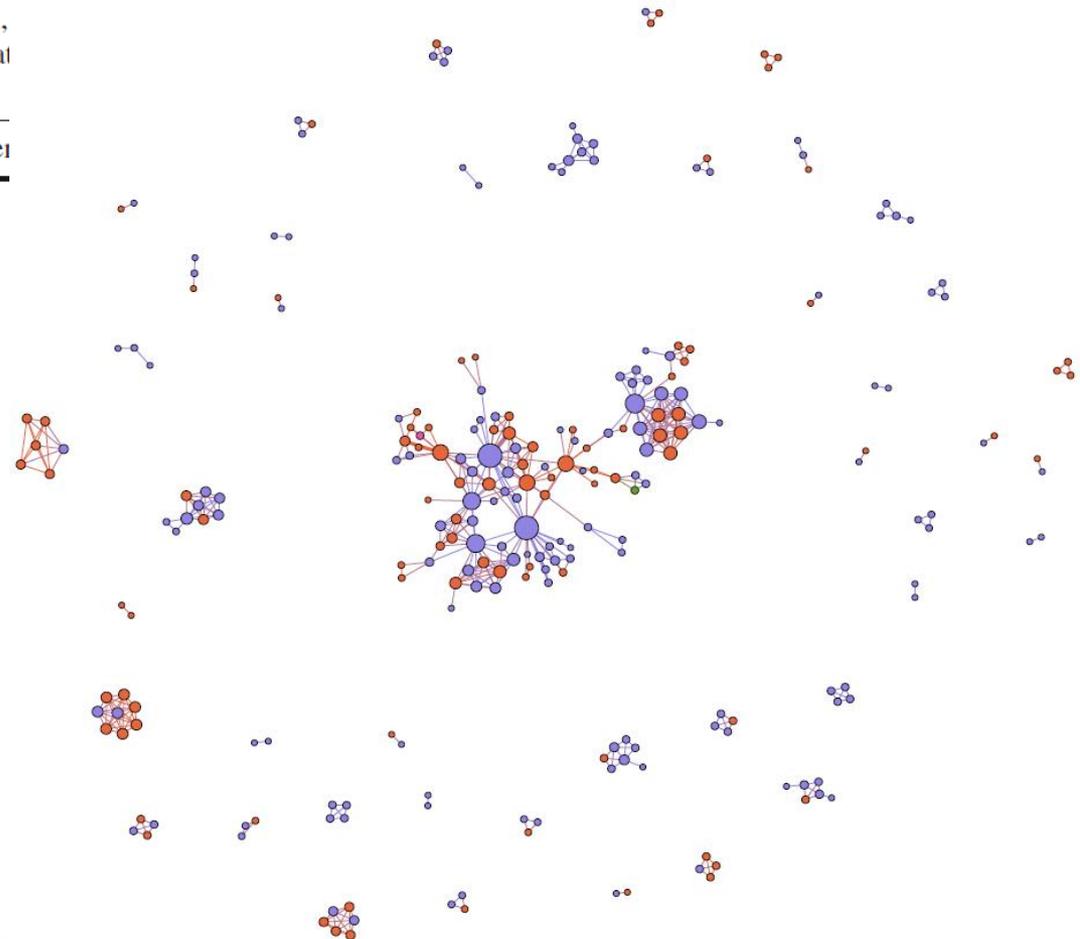
- sixteen European NKOS workshops from 2000 to 2016. In total 16 workshop agendas: ECDL 2000, 2003–2010, TPDL 2011–2016, Dublin Core 2016,
- eight US NKOS workshop agendas: JCDL 2000–2003, 2005 and NKOS-CENDI 2008–2009, 2012,
- four special issues on NKOS [8,14,24,25], and
- two scattered NKOS workshops at ISKO-UK 2011 and ICADL 2015.

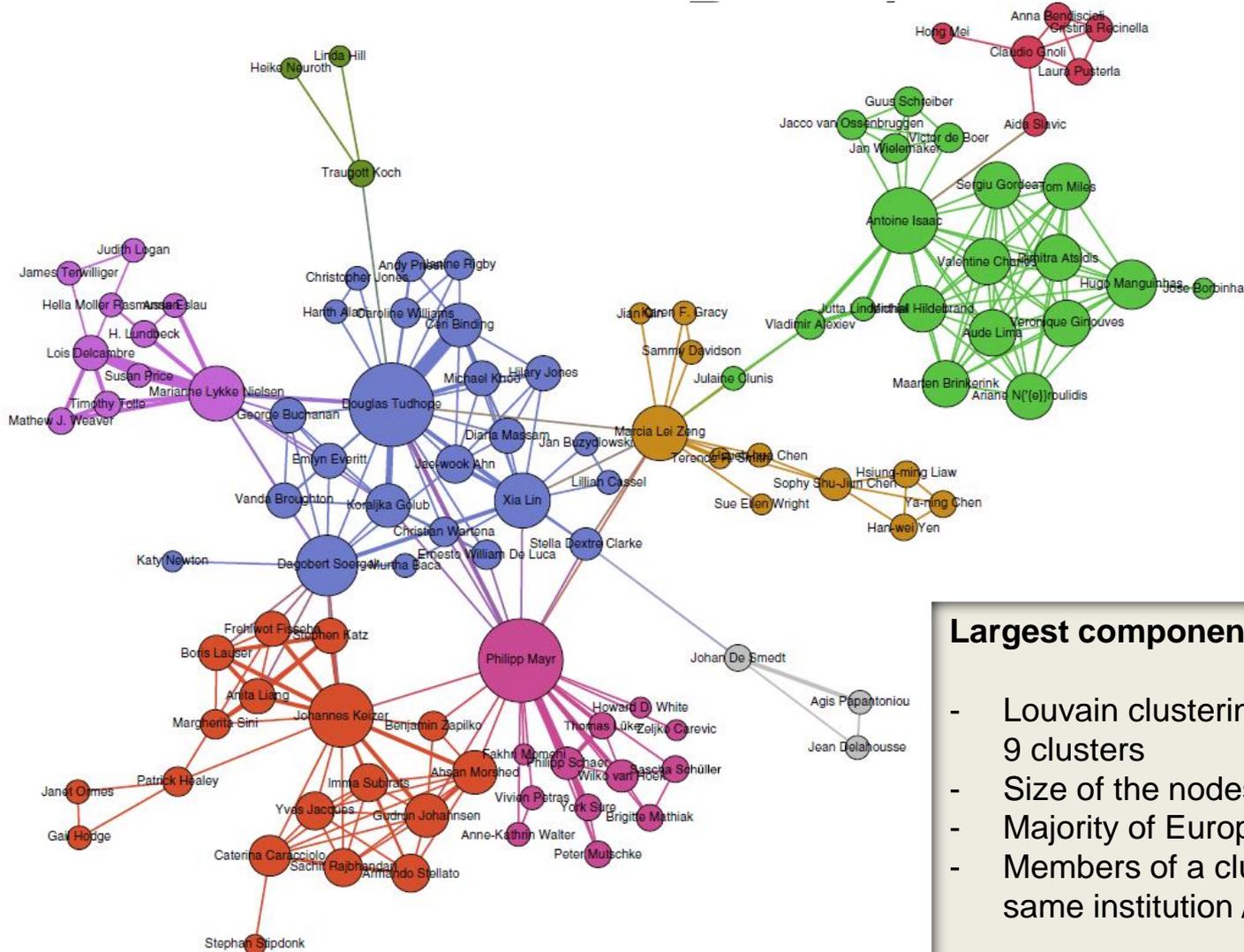
Results

- 44 isolated components
- Largest connected component (107 nodes)
- Men = purple, women = orange

Table 1 Overview of all NKOS papers sorted by years. In general, community shows a high average clustering in many years indicate that there are many triangles in the network

Year	Nr. of papers	Nr. of authors	Nr. of links	Avg. cluster
2001	4	9	6	0.37
2002	3	10	13	0.8
2003	5	12	9	0.4
2004	13	39	47	0.65
2005	7	22	26	0.81
2006	11	33	39	0.73
2007	4	15	24	1.0
2008	7	15	9	0.2
2009	10	34	60	0.68
2010	8	21	19	0.61
2011	8	32	59	0.80
2012	6	26	56	0.92
2013	5	18	31	0.86
2014	6	16	13	0.85
2015	9	24	23	0.58
2016	17	60	114	0.75





Largest component:

- Louvain clustering method identified 9 clusters
- Size of the nodes represent the degree
- Majority of European researchers
- Members of a cluster are often from the same institution / geographic proximity

Gender differences

- 97 (38%) women and 157 (62%) men and 2 unidentified names
- 46 women and 59 men in the largest component
- Homophily:
 - gender assortativity in this community is 0.1
“there is a **positive tendency** among scholars in this community **to collaborate with the same gender**”
 - homophily among women is higher than the homophily among men in this network (see Slide 5)

Conclusions

- Limited dataset:
 - Focus on research paper presentations (organization activity not covered)
 - Influential papers and standards are missing
 - Bibliometric data is missing
- Future work:
 - Complementing the dataset
 - Combining network and bibliometric measures

Thank you

Contact:

Dr Philipp Mayr
 GESIS - Leibniz Institute for the Social Sciences
 Germany
 Email: philipp.mayr@gesis.org
 Twitter: @philipp_mayr

Please consider to contribute to the NKOS Bibliography
<https://github.com/PhilippMayr/NKOS-bibliography>

Special thanks go to my co-authors:
Fariba Karimi and **Fakhri Momeni**

The screenshot shows a web browser window displaying an article on SpringerLink. The article title is "Analyzing the network structure and gender differences among the members of the Networked Knowledge Organization Systems (NKOS) community". The authors listed are Fariba Karimi, Philipp Mayr, and Fakhri Momeni. The article was first online on 14 June 2018. There are 1 share and 36 downloads. The abstract text reads: "In this paper, we analyze a major part of the research output of the Networked Knowledge Organization Systems (NKOS) community in the period 2000–2016 from a network analytical perspective. We focus on the papers presented at the European and US NKOS workshops and in addition four special issues on NKOS in the last 16 years. For this purpose, we have generated an open dataset, the “NKOS bibliography” which covers the bibliographic information of the research output. We analyze the co-authorship network of this community which results in 123 papers with a sum of 256 distinct authors. We use standard network analytic measures such as degree,

<https://doi.org/10.1007/s00799-018-0243-0>