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

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2018-09-13, Porto, Portugal

@article{karimi2018,
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.)

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NKOS Workshops - (Networked Knowledge Organization Systems and Services)

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

- 2005 – at ECDL, Vienna, Austria.
- 2006 – at ECDL, Alicante, Spain.
- 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.
- 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

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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
Dataset & Analysis

  — 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
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 indicating that there are many triangles in the network.

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

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)
  – Influencial papers and standards are missing
  – Bibliometric data is missing

• Future work:
  – Complementing the dataset
  – Combining network and bibliometric measures
Thank you

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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

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