Codebook - How does team science work?

Nicolas Robinson-Garcia

February 19, 2019

I look at what happens descriptively but also considering trajectories. I have the impression that I should rethink how I want to go on with this. Which specific aspects I want to show and what is the story I'd like to tell. Diana's way of writing is very impulsive and I do not know if that is the way I'd like to go about this.

If the purpose of this is to show how profiles co-exist, maybe I should (based on my seed scholars), start to profile researchers and then maybe do it by periods.

1. Is there team science?

1.1 Are these teams stable over time?

Variables needed from WoS:

- Cluster_id
- All classic bibliometric indicators
- Number of collaborators from same institution
- Number of external collaborators
- Number of collaborators from same institution by publication
- Number of external collaborators by publication

1.2 Is there activity visible through co-authorship?

Check groups identified with manual checking in the web and maybe interviews

2. Do research teams operate in a coordinated way?

Here it would be interesting to understand dependence relationship. Nederhof & van Raan (1993) refer to the star effects as what happens when a PI retires and the research group disappears. Here we should go beyond bibliometrics and see if there is someone in charge of the funding, someone of hiring and finding opportunities, someone who is more of a public face, etc. Also it would be interesting to use network analysis to determine authorities, hubs, etc. and contrast with their judgment Variables needed from WoS:

- Authorship position.
- Acknowledgments data
- Clusters from Ludo's subject classification to identify areas of specialization per subject.

Combine this with interviews plus manually checking for:

- Social media activity
- Google Scholar data

This is done to check for social engagement profiles

2.1 Do they have a common research agenda?

2.2 How is this agenda established?

3. How does team science affect individual trajectories?

3.1 How is credit shared?

3.2 What is the relation between the role exerted and academic status?

Cohort analysis?

3.2 How is continuity of supporting scientists ensured?

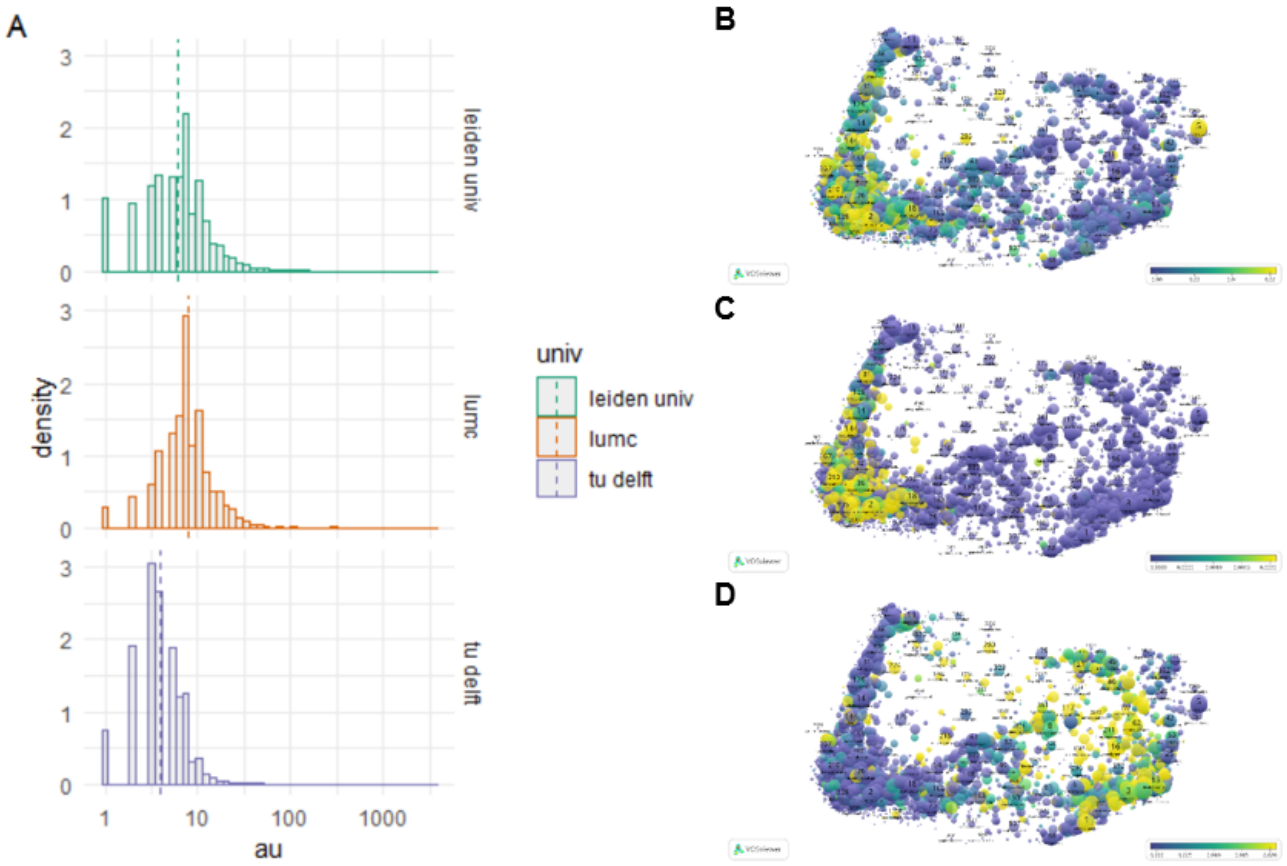
Probably also from interviews. How do scholars change from institution or are maintained if they are not able to 'make the next step'.

4. Data and methods

The identification of research groups is done bibliometrically and based on Web of Science publications. For this I have selected all publications between 2008 and 2017 by LUMC, Leiden University or TU Delft. The following table includes some descriptives. Here I must note that researchers belonging to institutions are not based on the specific affiliation linkage of docs (which uses the Leiden Ranking affiliation already cleaned up), but based on `cluster_id` with either of the three institutions as their main or alternative address. This should be checked to see if there is a way to link to the `cluster_id` organizations to the cleaned affiliations from Leiden Ranking. I had to clean up this data myself. In any case this should not be a concern for the selection of case studies.

	TU Delft	Leiden Univ	LUMC
Publications	24,233	49,149	3,188
Researchers	9,975	14,116	279
Collaborators	34,409	117,307	14,153
Mean au/p	4.7	9.6	10.1
Median au/p	4	6	8
Sd au/p	5.4	31.5	18.7

The next figure shows the distribution of papers based on the number of authors by paper (A) and the thematic profile of each of the three institutions. Leiden University is the largest of the three institutions with a more comprehensive portfolio, although mostly focues on Biomedical Sciences and Social Sciences. This focus on biomedical sciences is obviously more noticeable in the case of LUMC, although it still has some pubications in fields of the social sciences, mostly related with Public Health. Finally, TU Delft shows a profile focused on Phisics, Engineering and Mathematics. While there might be an overlap between LUMC and Leiden University, the high preponderance of biomedical literature might also be due to a close relation between these universities.



4.1 Selection of case studies

Six case studies will be selected. Three for each university and two by field. The purpose of this is not only to identify differences by discipline but also by institutional type. The fields are:

1. Physics and Engineering
2. Social Sciences and Humanities
3. Biomedical Sciences

Following I include the collaboration networks for each university and field. I have included a threshold of at least 10 publications by `cluster_id`, filtered by the giant component and calculated the betweenness centrality of each node. I have selected as seed researcher the one with the highest centrality.

Physics & Engineering

1. TU Delft

Notes:

- 1260 nodes (21.9% visible); 4702 edges (27.1% visible).
- `cluster_id` with highest betweenness = 33800547; Betweenness centrality: 0.11; Total publications = 159; Age = 32
- Name: Frans D. Tichelaar; First year: 1986; Last year: 2018
- PURE: https://pure.tudelft.nl/portal/en/persons/fd-tichelaar(56299c58-b6ec-478b-b188-b8744b69d954).html
- Institution: http://nchrem.nl/people/dr-ir-f-d-tichelaar-frans/

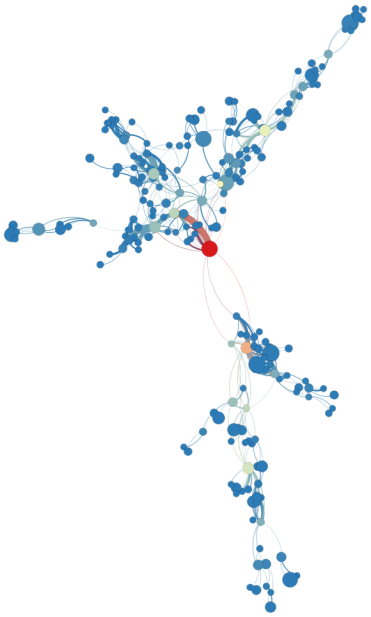
2. Leiden Univ

Notes:

- 765 nodes (35.1% visible); 3409 edges (40.6% visible).
- `cluster_id` with highest betweenness = 25501410; Betweenness centrality: 0.23; Total publications = 590; Age = 38
- Name: Ewine F. van Dishoeck; First year: 1980; Last year: 2018
- Institution: https://local.strw.leidenuniv.nl/people/touchscreen2/persinline.php?id=16
- Personal website: https://home.strw.leidenuniv.nl/~ewine/

Biomedical and Health Sciences

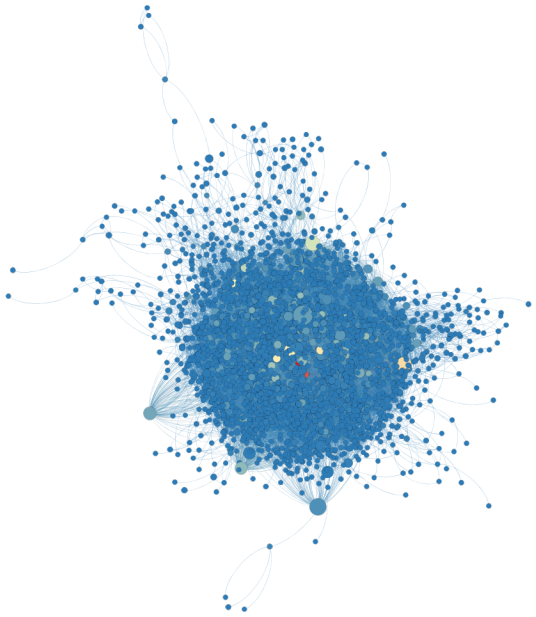
1. TU Delft



Notes:

- 214 nodes (18.9% visible); 615 edges (25.49% visible).
- `cluster_id` with highest betweenness = 43204348; Betweenness centrality: 0.50; Total publications = 341; Age = 31
- Name: Harrie H. Weinans; First year: 1987; Last year: 2018
- Google Profile: https://scholar.google.com/citations?user=di4NUp8AAAAJ&hl=en
- PURE: https://pure.tudelft.nl/portal/en/persons/hh-weinans(f31bd75b-1863-4202-b64b-7356538284a7)/publications.html
- Co-affiliated to UMC Utrecht and TU Delft.

2. Leiden Univ

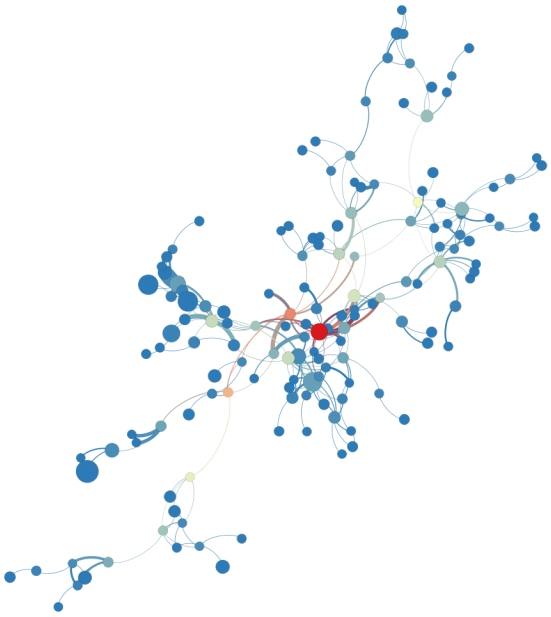


Notes:

- Due to the density of the network the selected node can scarcely be seen.
- 3304 nodes (38.8% visible); 43647 edges (59.6% visible).
- `cluster_id` with highest betweenness = 19936939; Betweenness centrality: 0.47; Total publications = 185; Age = 27
- Name: Ron Wolterbeek; First year: 1991; Last year: 2018
- Institution: https://www.lumc.nl/org/bds/medewerkers/rwolterbeek
- Affiliated to LUMC.

Social Sciences and Humanities

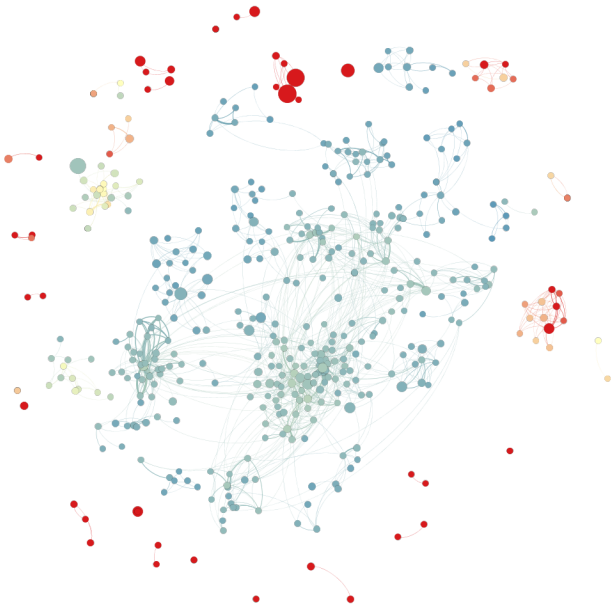
1. TU Delft



Notes:

- 151 nodes (12.6% visible); 281 edges (15.8% visible).
- `cluster_id` with highest betweenness = 12392841; Betweenness centrality: 0.41; Total publications = 134; Age = 18
- Name: Bert van Wee; First year: 1999; Last year: 2018
- Google Profile: https://scholar.google.es/citations?user=dYUiqMYAAAAJ&hl=en
- Institution: https://www.tudelft.nl/en/tpm/about-the-faculty/departments/engineering-systems-and-services/people/full-professors/profdr-gp-bert-van-wee/

2. Leiden Univ



Notes:

In this case, the selection of the seed researcher was not based on network indicator. The network above has the OpenOrd layout (instead of Yi) and K-Core=1 group. The main issue here is that this field is largely populated by biomedical scientists and psychologists and psychiatrists, fields which are not good representations of Social Sciences and Humanities. What I have done is looked at those pairs of scholars with the highest shares of co-authored papers and go down the list until I found someone who was not from these fields nor from CWTS (Ludo and Nees are the third pair with more co-authored papers)

- 478 nodes (26.5% visible); 1294 edges (43.1% visible).
- `cluster_id` selected = 36871407; Betweenness centrality: 0.00; Total publications = 78; Age = 18
- Name: Judi Mesman; First year: 2000; Last year: 2018
- Institution: https://www.universiteitleiden.nl/en/staffmembers/judi-mesman/publications#tab-1
- Lab1: http://www.diversityinparenting.nl/
- Lab2: https://www.societalchallengeslab.com/