Center for Public Health Systems Science

Brown School

Interactive Web-Based Applications for Network Analysis in Evaluation

American Evaluation Association: Emerging Tools and Technology in Evaluation

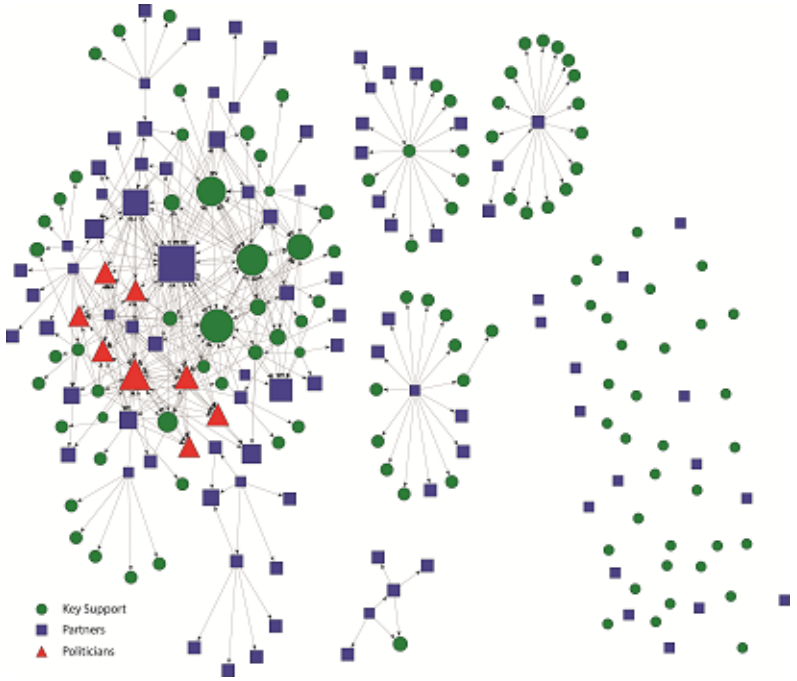
Bobbi J. Carothers

October 31, 2018

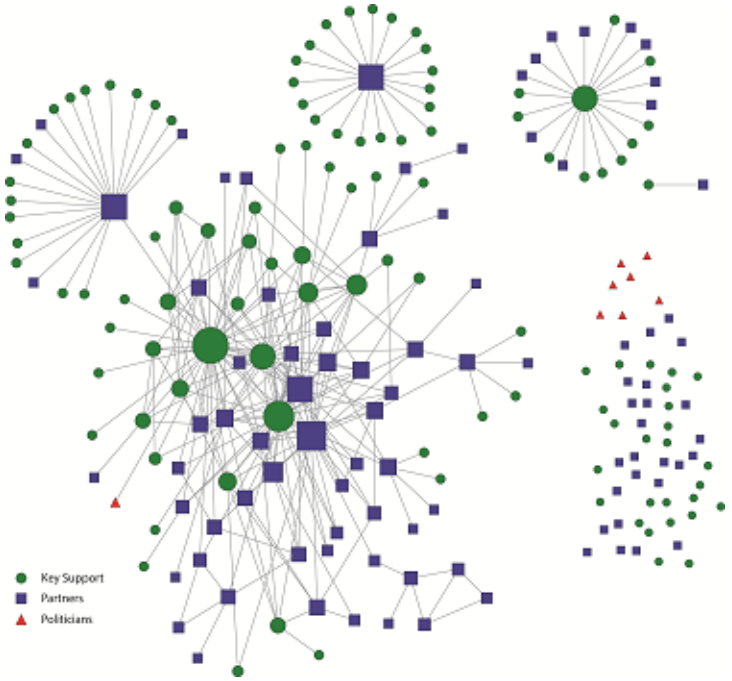
Why network analysis?

Communication Gaps

Policy Change [1]



CPPW Important

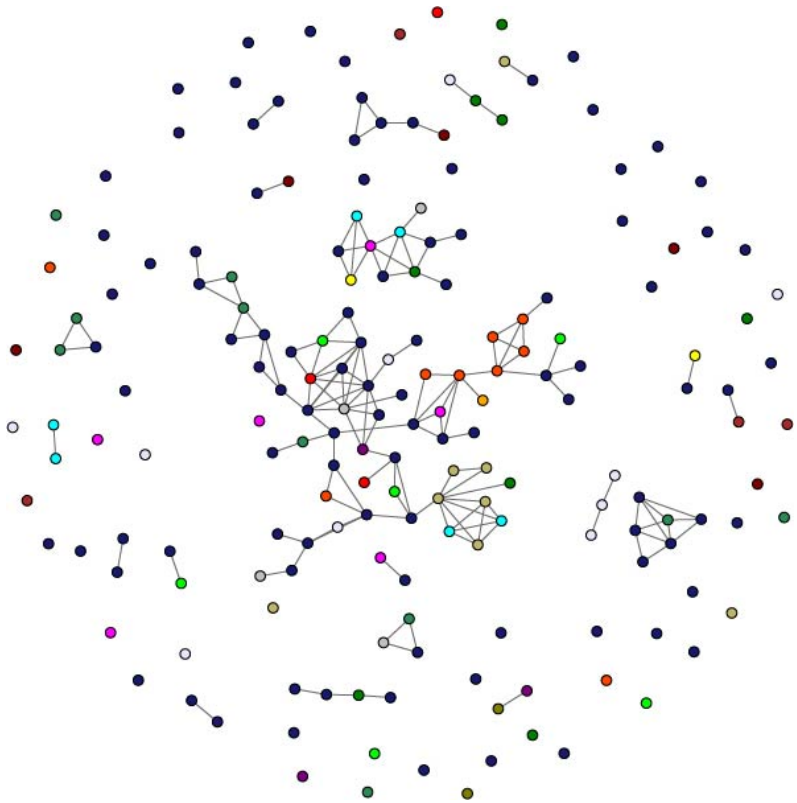


CPPW Contact

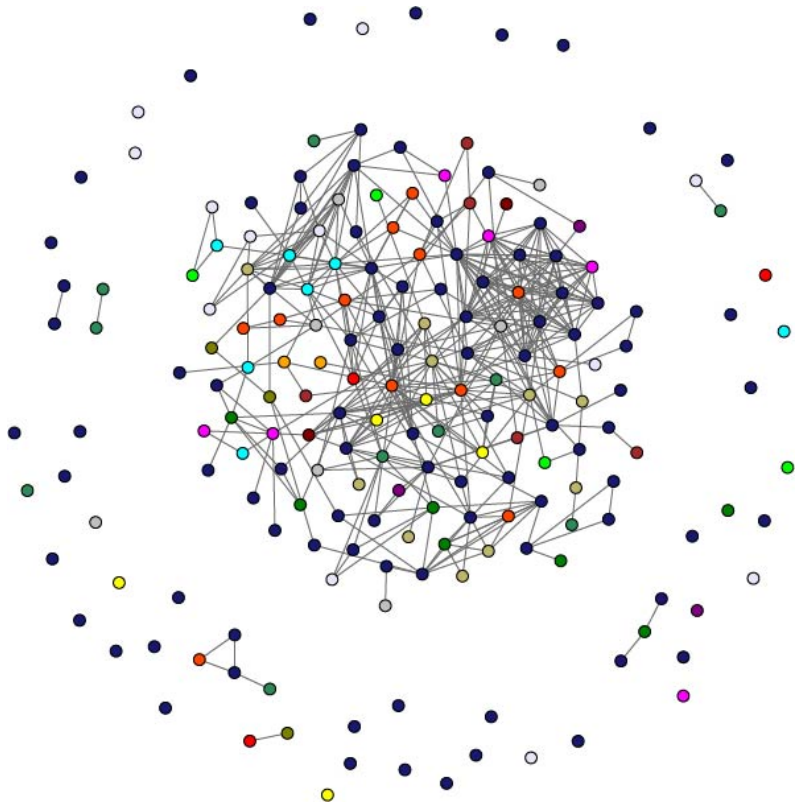
1. Moreland-Russell S, Carothers BJ. (2015) An examination of two policy networks invovled in advancing smokefree policy initiatives. *Int J of Envoron Res Public Health, 12*(9): 11117-11131.

Change Over Time

Cross-Disciplinary Science [2]



ICTS Grants 2007

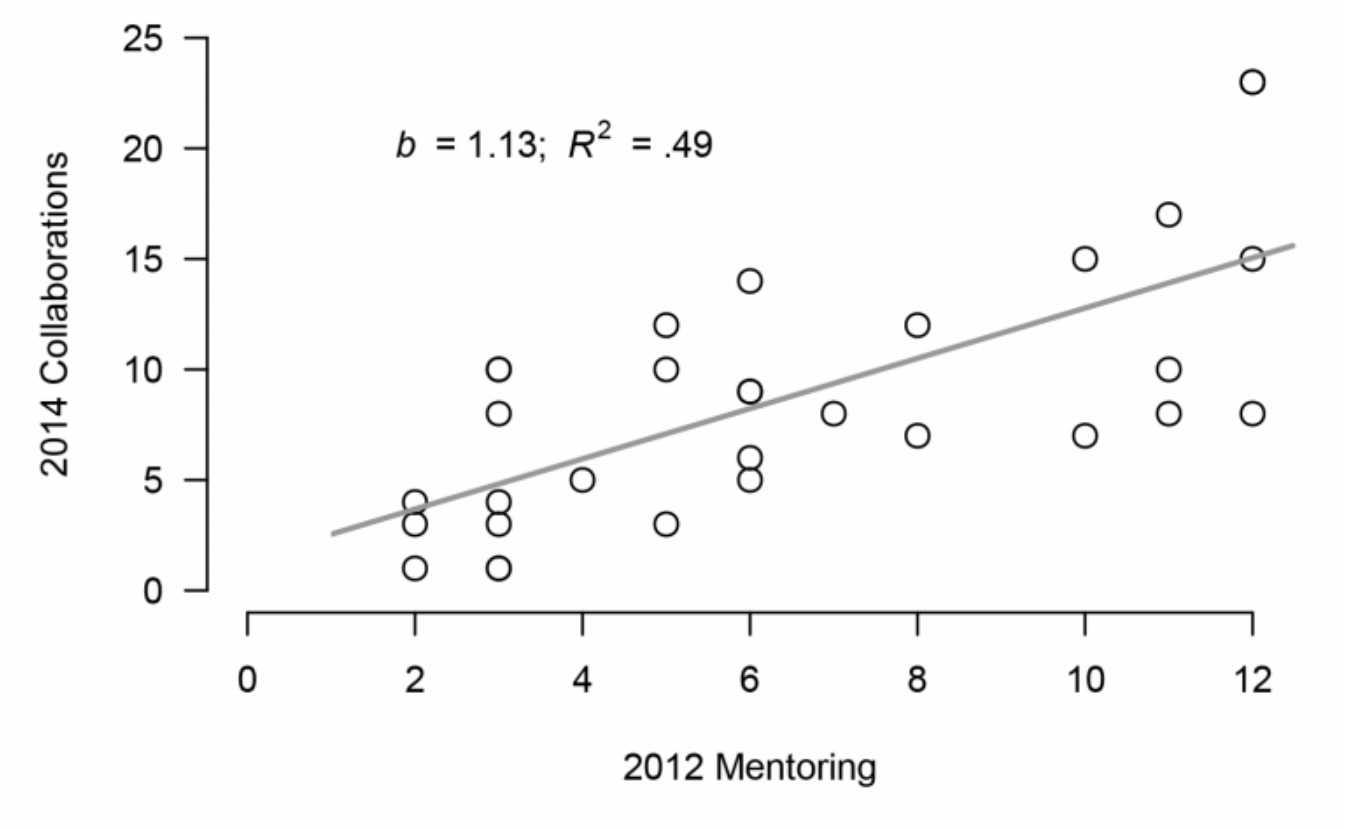


ICTS Grants 2010

2. Luke DA, Carothers BJ, Dhand A, Bell RA, Moreland-Russell S, Sarli CC, Evanoff BA. (2015) Breaking down silos: Mapping growth of cross-disciplinary collaboration in a translational science initiative. *Clin Transl Sci, 8*(2): 143-149.

Modeling & Hypothesis Testing

Mentoring & Productivity [3]



3. Luke DA, Baumann A, Carothers BJ, Landsverk J, Proctor EK. (2016) Forging a link between mentoring and collaboration: A new training model for implementation science. *Implement Sci, 11*(1):137.

Why dashboards?

Tableau

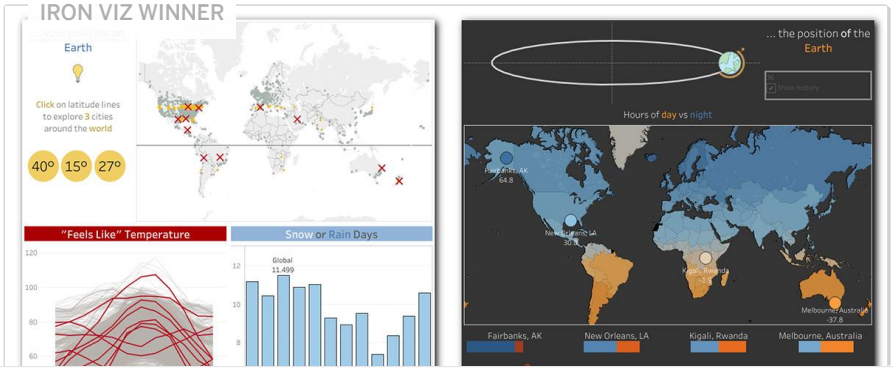
GALLERY AUTHORS BLOG RESOURCES ACTIVITY SIGN IN

Gallery / Greatest Hits

Stunning data visualization examples from across the web created with Tableau Public.

Viz of the Day Featured

Subscribe



With Weather, Location is Relative

Iron Viz 2018 champion Timothy Vermeiren shows the effects of one's position **on** Earth (left) and the position **of** Earth (right) on how we experience weather.

October 29, 2018

R

Shiny/Flexdashboards

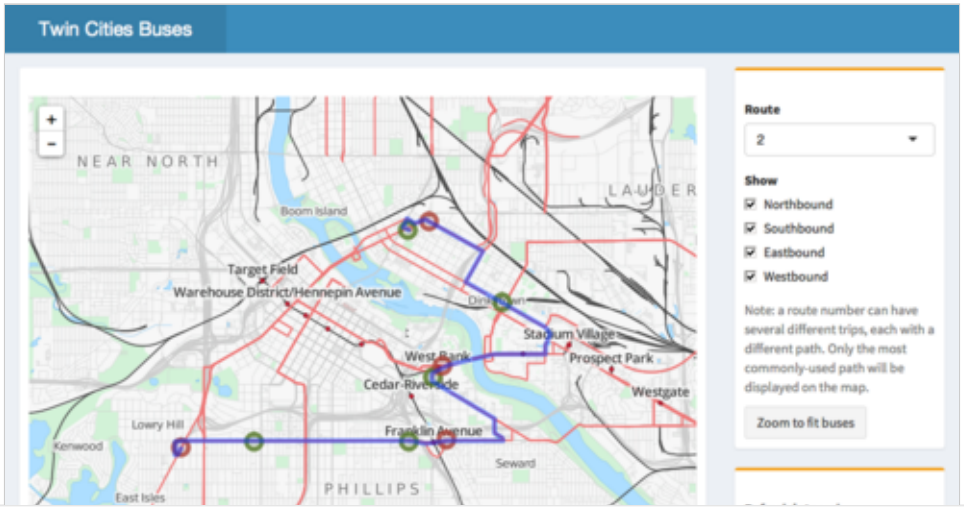
Examples in this site

Source code (https://github.com/rstudio/shinydashboard/tree/gh-pages/_apps) for all the example screenshots used in this site.

Twin Cities Buses

This app displays live locations of buses in the Minneapolis–Saint Paul Metro Transit system. It fetches data from a live feed (http://svc.metrotransit.org/), and uses the leaflet (http://rstudio.github.io/leaflet/) package to generate the map.

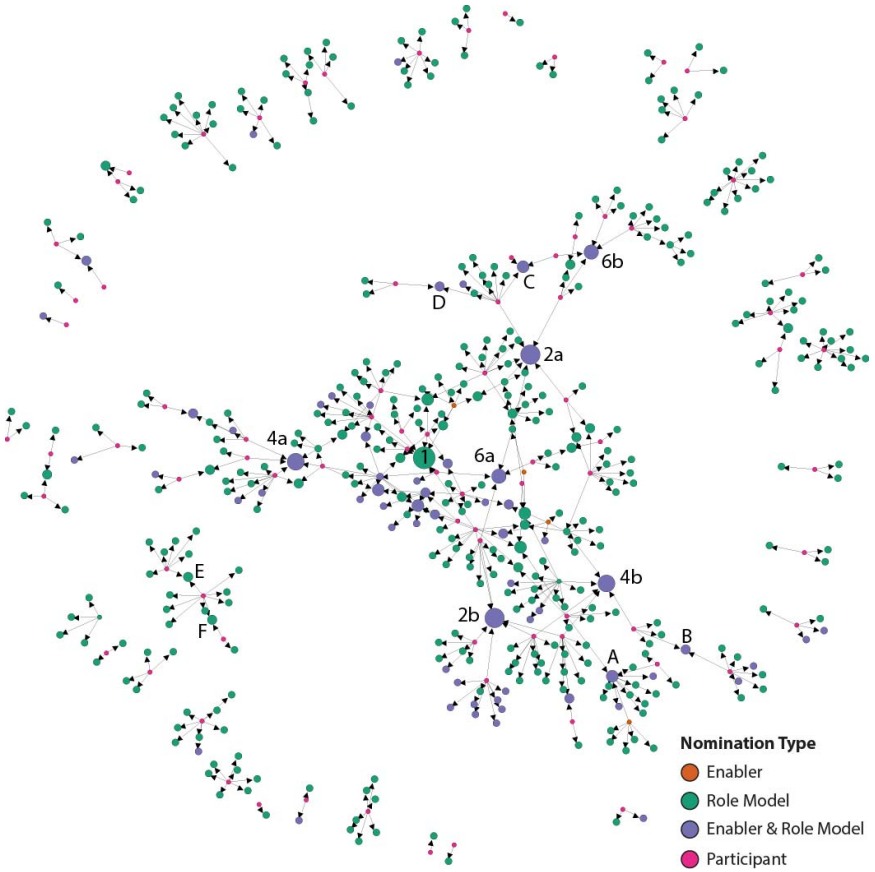
Source code (https://github.com/rstudio/shiny-examples/tree/master/086-bus-dashboard)



Why network dashboards?

Static visualiation

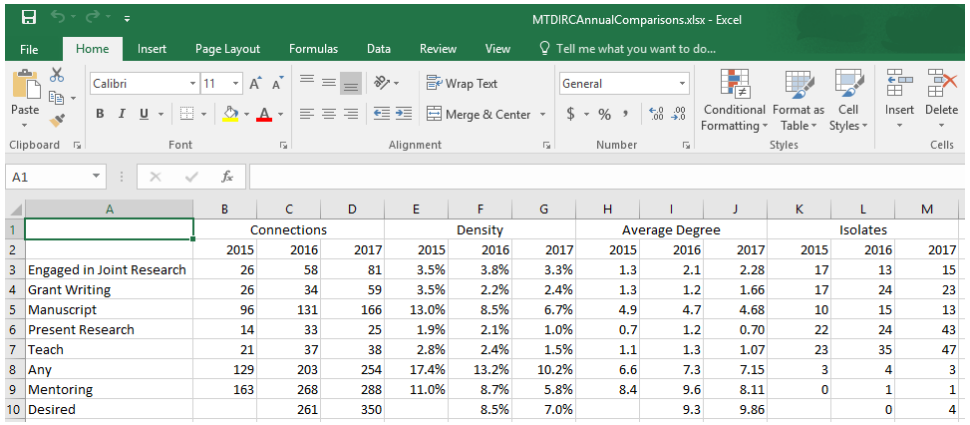
- With large networks, difficult to:
  - Label & identify individual nodes
  - See who is connected to who
- Overwhelmed with options
  - Size nodes by
    - Degree?
    - Influence?
  - Which level to show contact?
    - Weekly?
    - Monthly?
    - Annually?



ReThink Health National Role Models

Static data

- Sorting is essential, but impossible with paper documents
- Excel documents are sometimes ugly and overwhelming



		Connections			Density			Average Degree			Isolates		
		2015	2016	2017	2015	2016	2017	2015	2016	2017	2015	2016	2017
3	Engaged in Joint Research	26	58	81	3.5%	3.8%	3.3%	1.3	2.1	2.28	17	13	15
4	Grant Writing	26	34	59	3.5%	2.2%	2.4%	1.3	1.2	1.66	17	24	23
5	Manuscript	96	131	166	13.0%	8.5%	6.7%	4.9	4.7	4.68	10	15	13
6	Present Research	14	33	25	1.9%	2.1%	1.0%	0.7	1.2	0.70	22	24	43
7	Teach	21	37	38	2.8%	2.4%	1.5%	1.1	1.3	1.07	23	35	47
8	Any	129	203	254	17.4%	13.2%	10.2%	6.6	7.3	7.15	3	4	3
9	Mentoring	163	268	288	11.0%	8.7%	5.8%	8.4	9.6	8.11	0	1	1
10	Desired		261	350		8.5%	7.0%		9.3	9.86		0	4

Network Statistics

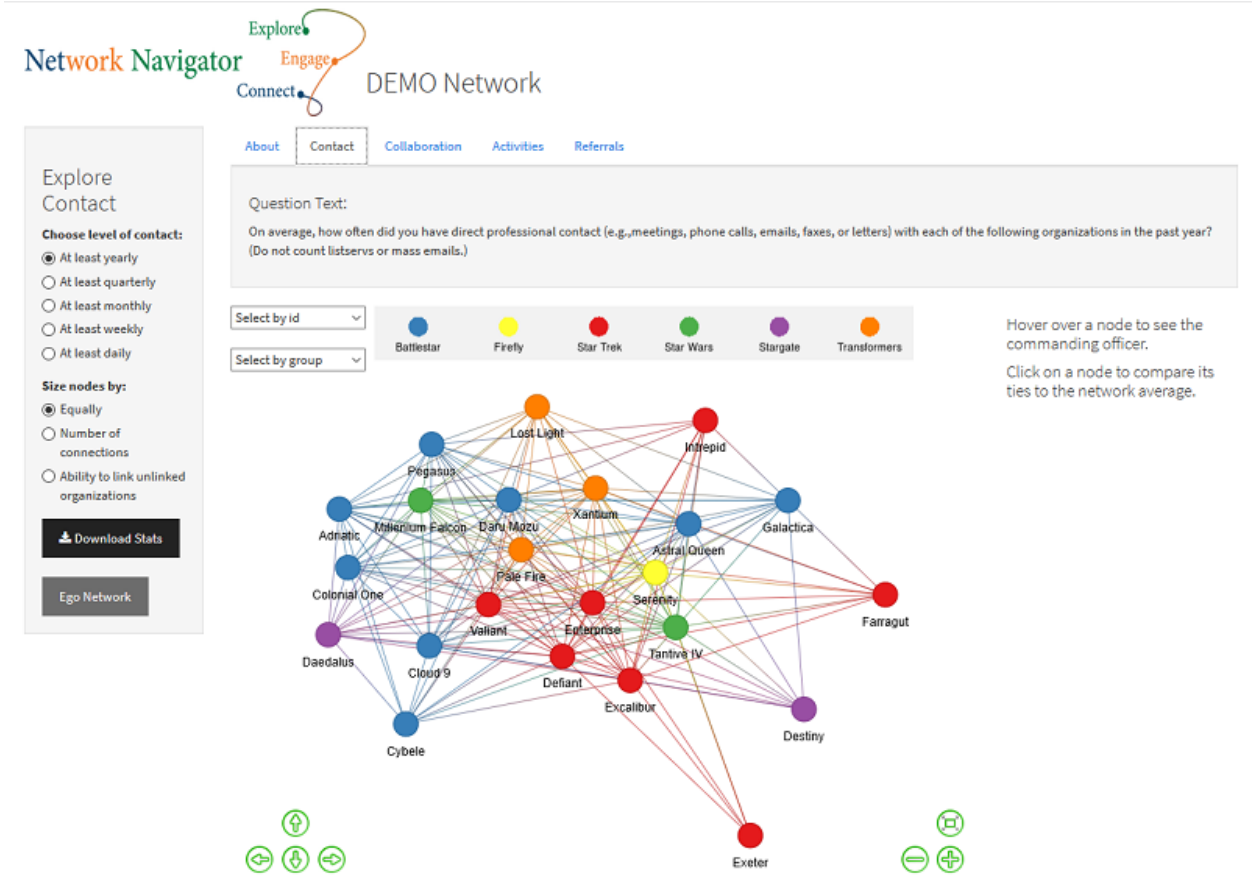
Status	Discipline	EngagedResear	WroteGra	Manuscrip	PresentRe	TeachDeg	Collabora	MentorIn	MentorOu	DesiredIn	DesiredOut
2014	Allied Health	5	3	16	1	0	17	6	9	5	4
2014	Allied Health	1	0	15	0	0	15	5	0	1	4
2014	Allied Health	0	0	0	0	0	0	2	1	1	0
2014	Allied Health	1	0	12	0	0	12	4	1	0	17
2014	Allied Health	2	1	6	2	1	9	7	3	5	7
2014	Social Science/St	3	2	7	1	0	10	2	2	5	3
2014	Allied Health	1	1	3	1	1	4	5	3	6	10
2014	Allied Health	1	2	4	0	0	5	12	3	2	7
2014	Allied Health	3	0	7	0	0	10	3	1	2	1
2014	Basic Science	0	0	7	0	0	7	7	2	4	6
2014	Allied Health	4	0	13	1	1	16	10	7	8	2
2014	Allied Health	2	0	5	0	0	7	4	2	0	1
2014	Clinical	2	2	12	2	0	13	9	7	2	0
2014	Allied Health	0	0	2	0	0	2	3	0	2	7
2015	Allied Health	0	0	0	0	0	0	3	0	3	6
2015	Allied Health	5	2	1	1	1	6	3	2	6	8

Node Statistics

Our solution

Network Navigator

Demonstration network



https://netnav.shinyapps.io/demonet/

Features

- Network Selections
  - Relationship
  - Level
  - Node sizing
- Node Selections
  - Comparison statistics
  - Ego Networks
- Hover-overs
  - Node information
  - Table definitions
- Downloads
  - Network & node statistics
  - Right-click for graphics
- Information page
  - Project background & purpose of app
  - Definitions
- Security
  - Can be public or private
  - Invite users to create accounts to private apps as per stakeholder request

Is it worth it?

- Benefits
  - Facilitates direct stakeholder engagement with results
  - Eases interpretation of connections and network structure
  - Highly customizable -> Opportunities for stakeholders to contribute to design
- Challenges
  - Steep learning curve
  - Designing for a non-network audience

Resources

- https://shiny.rstudio.com/tutorial/
- https://www.showmeshiny.com/
- https://shiny.rstudio.com/gallery/
- https://datastorm-open.github.io/visNetwork/
- https://stackoverflow.com/

Contact Us

Bobbi Carothers

bcarothers@wustl.edu