

NodeXL Pro Tutorial:

Social network and content analysis with Twitter network data – step by step

Last updated: February 12th, 2019





About this Tutorial

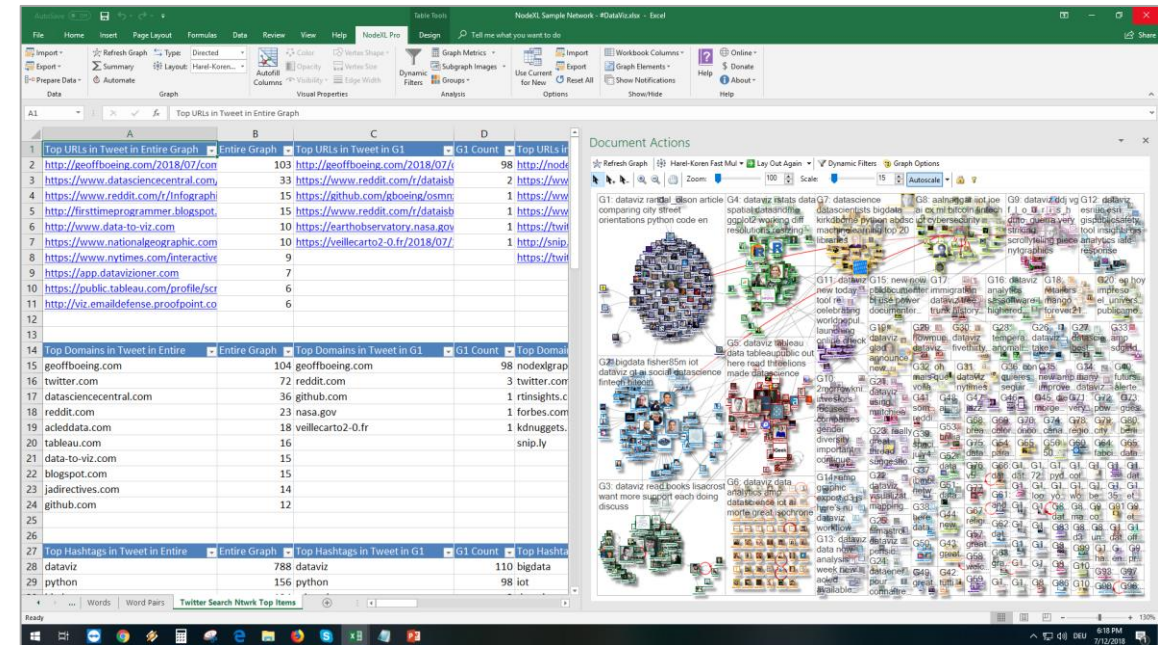
About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

This tutorial shows you how you can run a full social network and content analysis with NodeXL Pro.

While we will use Twitter network data as an example, this approach can be applied to any network dataset of your choice (depending on the available metadata).



If you have any questions, please send us an email: info@smrfoundation.org

More NodeXL Pro Tutorials can be found here: <https://www.smrfoundation.org/nodexl/tutorials>

1. Getting Started

About this Tutorial

1. Getting Started

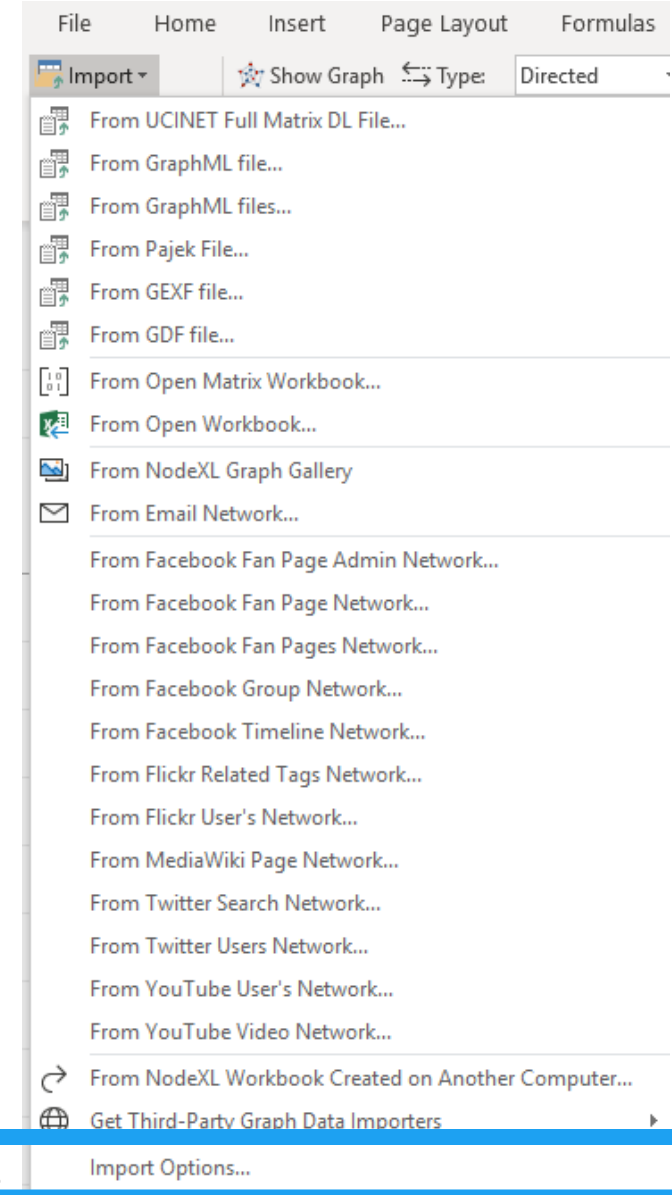
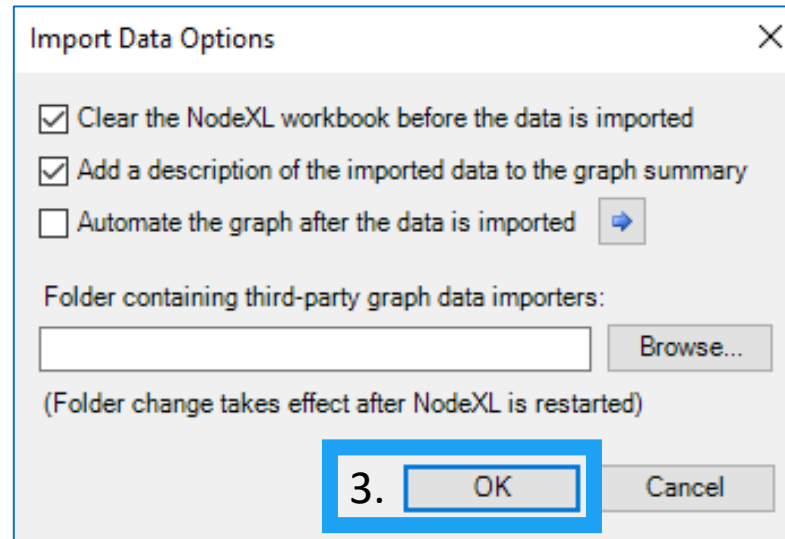
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Before downloading network data, **save the file** to your machine. It is helpful to add the data source and date to the name file e.g.:

Social Network Analysis Twitter 2019-01-25.xlsx

2. Open the **Import Data Options** window to select basic options related to the data import: **Data > Import > Import Options**
3. Select the options shown below and click **OK**.



2. Data Import

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Open the Twitter Search Network importer: **Data > Import > From Twitter Search Network...**
2. Enter a search query of your choice.
3. Select **Basic network**.
4. Limit # of tweets to **1.000**.
5. Click **OK**.
6. Wait for approx. 3-5 minutes.
7. **Save the file** after the data download is finished.

The **Edges** and **Vertices** spreadsheets now contains network data and additional metadata. Take a look at the worksheets and explore the data.

Import from Twitter Search Network

[This might take a long time: Twitter rate limiting](#)

Search for tweets that match this query:

2.

[How to use advanced search operators](#)

What to import

3. ☒ Basic network

Show who was replied to or mentioned in recent tweets

[More about this option](#)

☐ Basic network plus friends (very slow!)

Add some of the users' friends

[More about this option](#)

Your Twitter account

☐ I have a Twitter account, but I have not yet authorized NodeXL to use my account to import Twitter networks. Take me to Twitter's authorization Web page.

☒ I have a Twitter account, and I have authorized NodeXL to use my account to import Twitter networks.

4. Limit to tweets

☒ Limit friends and followers to per user

☒ Expand URLs in tweets (slower)

☐ Extended analysis: perform a second pass on the collected Tweets to ensure that all Retweets are collected and all RetweetedIDs are correct. (Slow!)

5.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	T	U	V	W	X
1																								
2	Vertex ID	Vertex Name	Relationship	Date (UTC)	URL	Domains	Hashtags	Media in	Tweet Image	Tweet Date	Twitter Page													
109	nikivermel	realisico	Mentions	1/8/2019 16:32	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 16:32	https://twt													
110	vidmamati	socioscitoli	Retweet	1/8/2019 17:07	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 17:07	https://twt													
111	vidmamati	realisico	Retweet	1/8/2019 17:29	UK based @NodeXL expert available to run training events around the coo					1/8/2019 17:29	https://twt													
112	sonsoomed	was3210	Retweet	1/8/2019 17:29	UK based @NodeXL expert available to run training events around the coo					1/8/2019 17:29	https://twt													
113	sonsoomed	nodexl	Mentions	1/8/2019 17:29	UK based @NodeXL expert available to run training events around the coo					1/8/2019 17:29	https://twt													
114	joferie	socioscitoli	Retweet	1/8/2019 19:31	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 19:31	https://twt													
115	joferie	realisico	Mentions	1/8/2019 19:31	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 19:31	https://twt													
116	vanessa_jm	to	Retweet	1/8/2019 19:36	"I we are to understand OC in its current forms &mp; modalities, we mu					1/8/2019 19:36	https://twt													
117	marykdohe	socioscitoli	Retweet	1/8/2019 19:43	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 19:43	https://twt													
118	marykdohe	realisico	Mentions	1/8/2019 19:43	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 19:43	https://twt													
119	smr_founds	was3210	Retweet	1/8/2019 19:55	UK based @NodeXL expert available to run training events around the coo					1/8/2019 19:55	https://twt													
120	smr_founds	nodexl	Mentions	1/8/2019 19:55	UK based @NodeXL expert available to run training events around the coo					1/8/2019 19:55	https://twt													
121	marceladai	datascience	Retweet	1/8/2019 21:04	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 21:04	https://twt													
122	infonomical	datascience	Retweet	1/8/2019 21:05	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 21:05	https://twt													
123	artemisai	datascience	Retweet	1/8/2019 21:27	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 21:27	https://twt													
124	runningbird	datascience	Retweet	1/8/2019 21:39	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 21:39	https://twt													
125	bronika	insidertrack	Mentions	1/8/2019 21:57	@IWLevitt @dengaterade @Strava @InsideTracker Hahaha. I was gonna si					1/8/2019 21:57	https://twt													
126	bronika	strava	Mentions	1/8/2019 21:57	@IWLevitt @dengaterade @Strava @InsideTracker Hahaha. I was gonna si					1/8/2019 21:57	https://twt													
127	bronika	dengaterade	Mentions	1/8/2019 21:57	@IWLevitt @dengaterade @Strava @InsideTracker Hahaha. I was gonna si					1/8/2019 21:57	https://twt													
128	bronika	jwlevitt	Replies to	1/8/2019 21:57	@IWLevitt @dengaterade @Strava @InsideTracker Hahaha. I was gonna si					1/8/2019 21:57	https://twt													
129	jesus_emr	datascience	Retweet	1/8/2019 22:15	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 22:15	https://twt													
130	tonoballst	socioscitoli	Retweet	1/8/2019 22:24	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 22:24	https://twt													
131	tonoballst	realisico	Mentions	1/8/2019 22:24	First free AdvancedTraining alert of 2019! Bib advancedtraining					1/8/2019 22:24	https://twt													
132	ingijose	datascience	Retweet	1/8/2019 23:09	An Introduction to Sc https://vay datasciencecentral.com					1/8/2019 23:09	https://twt													
133	juneholley	juneholley	Tweet	1/8/2019 23:35	Home - International https://vay scoop.it					1/8/2019 23:35	https://twt													
134	obespy	was3210	Retweet	1/8/2019 23:39	UK based @NodeXL expert available to run training events around the coo					1/8/2019 23:39	https://twt													
135	obespy	nodexl	Mentions	1/8/2019 23:39	UK based @NodeXL expert available to run training events around the coo					1/8/2019 23:39	https://twt													
136	joaquinahv	joaquinahv	Tweet	1/8/2019 23:47	Home - International https://vay inna.org					1/8/2019 23:47	https://twt													
137	raehfina	was3210	Retweet	1/8/2019 23:50	Twitter's new Twitter Timeline: A new social network analysis plan, sentiment an					1/8/2019 23:50	https://twt													

2. Data Import

About this Tutorial

1. Getting Started
- 2. Data import**
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

You can build advanced search queries with **Twitter Standard Search Operators**:

<https://developer.twitter.com/en/docs/tweets/rules-and-filtering/overview/standard-operators>

Standard search:	Tesla
Exact phrase:	"Tesla Autopilot"
Exclude term:	Tesla –Nikola
Boolean query:	electric (car OR vehicle)
User search:	@Tesla
Search by language:	Tesla lang:en (fr/de/nl/...)
Search by date:	Tesla from:2019-02-05 Tesla until:2018-02-12
List analysis:	list:cspan/senators

(!) Test your query before downloading data: <https://twitter.com/search-home>

URL encoding might be necessary: <https://www.urlencoder.org/>

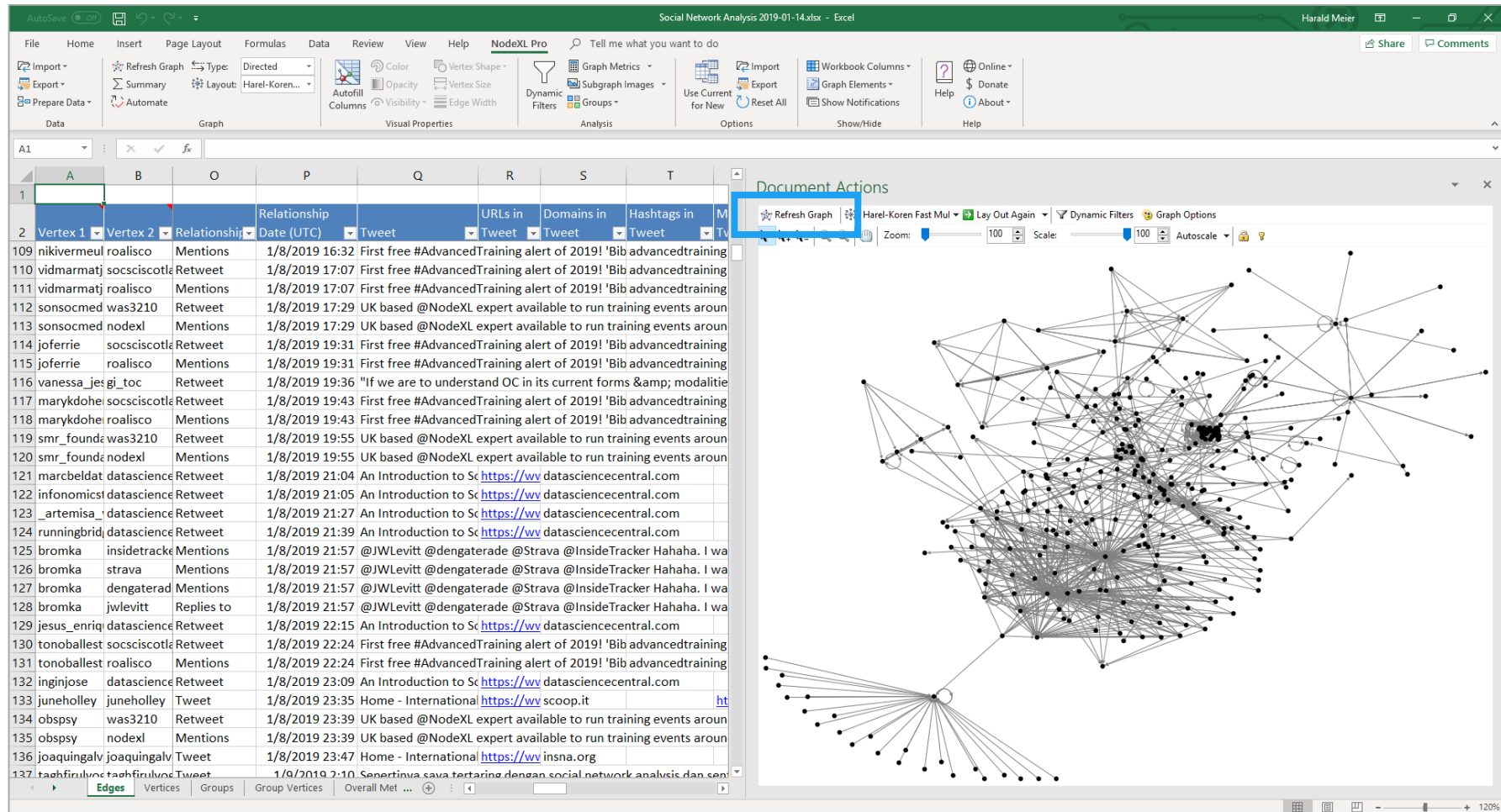
2. Data Import

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

When you click on **Show Graph/Refresh Graph** at the top of the graph window, you can already observe the connected structure of the downloaded raw data.



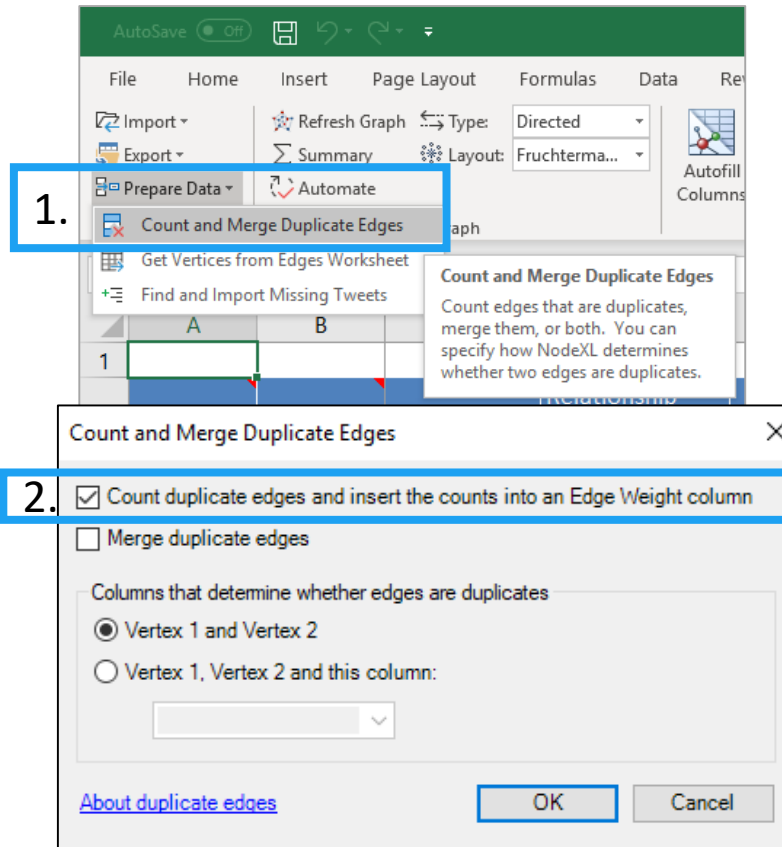
3. Prepare Data

About this Tutorial

1. Getting Started
2. Data import
- 3. Prepare data**
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Click on **Data > Prepare Data > Count and Merge Duplicate Edges**.
2. Check the box **Count duplicate edges and insert the counts into an Edge Weight column** and click **OK**.
3. Navigate to **column BA Edge Weight** that has just been created in the **Edges worksheet**. This column will be used later to visualize the strength of connections between the vertices.



BA1	A	B	AO	AP	AQ	AR	AS	AT	AU	AV	AW	AX	AY	AZ	BA
1															
2	Vertex 1	Vertex 2	Unified Twitter ID	Imported Tweet Type	Extended By	Counting	Counting	Counting	Full Name	Place ID	Name	Place Type	URL		Edge Weight
740	softnet_sea	mikequinda	1082887290	Tweet		0	0								5
741	softnet_sea	nodexl	1082887290	Tweet		0	0								5
742	softnet_sea	softnet_sea	1082887290	Tweet		0	0								2
743	softnet_sea	mikequinda	1082887290	Tweet		0	0								5
744	softnet_sea	nodexl	1082887290	Tweet		0	0								5
745	softnet_sea	iot_recruitin	1083770302	Tweet		0	0								1
746	softnet_sea	fisher85m	1083770302	Tweet		0	0								1
747	softnet_sea	darshan_h	1083770302	Tweet		0	0								1
748	softnet_sea	mikequinda	1083770302	Tweet		0	0								5
749	softnet_sea	nodexl	1083770302	Tweet		0	0								5
750	softnet_sea	mikequinda	1083936165	Tweet		0	0								5
751	softnet_sea	nodexl	1083936165	Tweet		0	0								5
752	softnet_sea	softnet_sea	1083936165	Tweet		0	0								2
753	softnet_sea	mikequinda	1083936165	Tweet		0	0								5
754	softnet_sea	nodexl	1083936165	Tweet		0	0								5
755	jackcolemaj	softnet_sea	1082887290	Tweet		0	0								1
756	chidambara	softnet_sea	1082887290	Tweet		0	0								2
757	chidambara	softnet_sea	1083936165	Tweet		0	0								2
758	kimberl877	iot_recruitin	1083770302	Tweet		0	0								2
759	kimberl877	fisher85m	1083770302	Tweet		0	0								2
760	kimberl877	darshan_h	1083770302	Tweet		0	0								4
761	kimberl877	mikequinda	1083770302	Tweet		0	0								8
762	kimberl877	nodexl	1083770302	Tweet		0	0								8
763	kimberl877	iot_recruitin	1083809812	Tweet		0	0								2

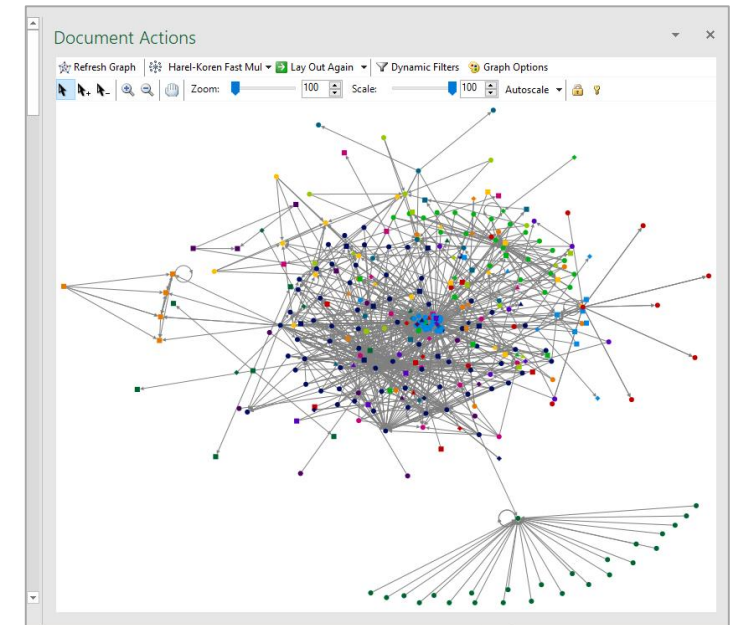
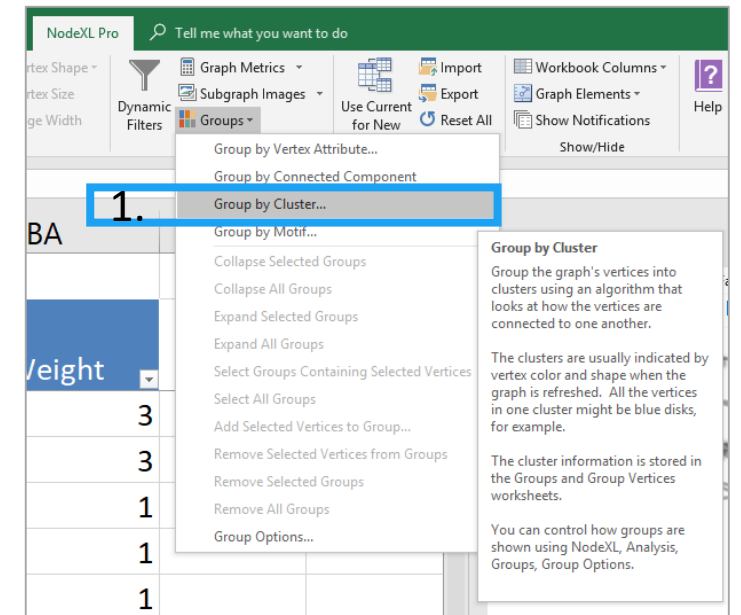
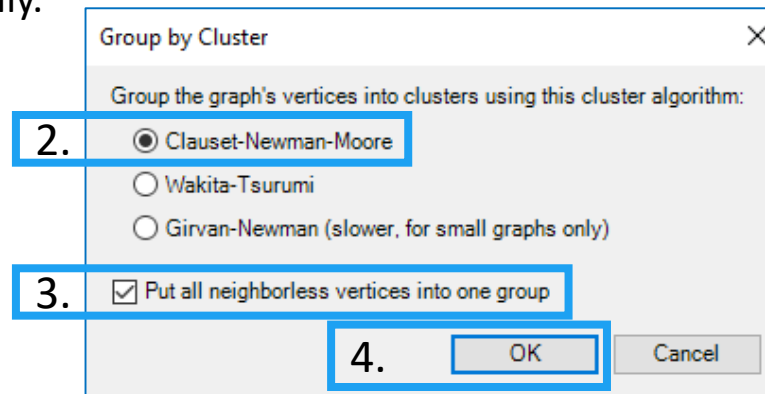
About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
- 4. Group by cluster**
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

4. Group by Cluster

1. Open the Group by cluster window: **Analysis > Groups > Group by Cluster...**
2. Select **Clauset-Newman-Moore**.
3. Select **Put all neighborless vertices into one group**.
4. Click **OK** and wait.
5. Take a look the **Group Vertices** and **Group Edges worksheets** which have just been created. Further, group related columns have been added to the **Edges** and **Vertices worksheets**.
6. Click **Refresh Graph**. Vertex colors and shapes have been added automatically.



Learn more about the Clauset-Newman-Moore clustering algorithm: A. Clauset, M. E. J. Newman, and C. Moore (2004): Finding community structure in very large networks. In: Phys. Rev. E 70.

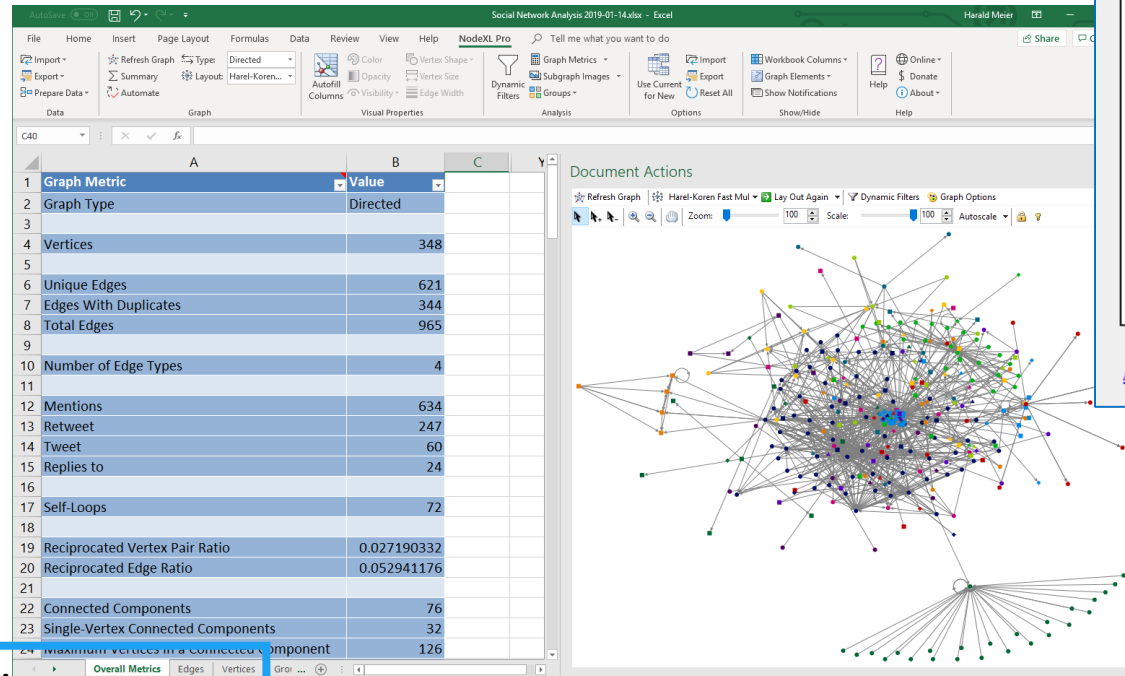
5. Calculate Metrics

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Open the Graph Metrics window: **Analysis > Graph Metrics > Graph Metrics**
2. Check the boxes as seen on the right.
3. Click **Calculate Metrics** and wait.
4. Have a look at the newly created worksheet **Overall Metrics** to analyze the composition of the network. Also take a look at the **Vertices** and **Groups** worksheets where the metrics have been added.



1. Graph Metrics

Metrics to calculate and insert into the workbook:

2.

☒ Overall graph metrics (count vertices, edges (by type), and more)
☐ Vertex degree (undirected graphs only)
☒ Vertex in-degree (directed graphs only)
☒ Vertex out-degree (directed graphs only)
☒ Vertex betweenness and closeness centralities
☒ Vertex eigenvector centrality
☒ Vertex PageRank
☒ Vertex clustering coefficient
☒ Vertex reciprocated vertex pair ratio (directed graphs only)
☒ Edge reciprocation (directed graphs only)
☒ Group metrics
☐ Time series
☐ Paths
☐ Words and word pairs
☐ Edge creation by shared content similarity
☐ Top items
☐ Twitter search network top items [OLD: to be removed soon]
☐ Network top items

Select All
Deselect All
Options...

Overall graph metrics (count vertices, edges (by type), and more)

The following overall metrics get inserted into the Overall Metrics worksheet:

Graph Type	Directed or undirected.
Vertices	The number of vertices in the graph.
Unique Edges	The number of edges that do not have duplicates.
Edges With Duplicates	The number of edges that have duplicates.
Total Edges	The number of edges in the graph. This is the sum

[About duplicate edges](#)

3. **Calculate Metrics**
Cancel

6. Time Series Analysis

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Open the Graph Metrics window: **Analysis > Graph Metrics > Graph Metrics**
2. Deselect everything but **Time Series**.
3. Click on **Options** to open the Time Series window.
4. Select the options as seen on the right.
5. Click **OK** and then **Calculate Metrics** to create the new spreadsheet **Time Series**.

1. Graph Metrics

Metrics to calculate and insert into the workbook:

- ☐ Overall graph metrics (count vertices, edges (by type), and more)
- ☐ Vertex degree (undirected graphs only)
- ☐ Vertex in-degree (directed graphs only)
- ☐ Vertex out-degree (directed graphs only)
- ☐ Vertex betweenness and closeness centralities
- ☐ Vertex eigenvector centrality
- ☐ Vertex PageRank
- ☐ Vertex clustering coefficient
- ☐ Vertex reciprocated vertex pair ratio (directed graphs only)
- ☐ Edge reciprocation (directed graphs only)
- ☒ Time series
- ☐ Words and word pairs
- ☐ Edge creation by shared content
- ☐ Top items
- ☐ Twitter search network top items
- ☐ Network top items

3. Options...

2. Time Series

Build a time series for this column

Relationship Date (UTC)

Choose time slices

Days

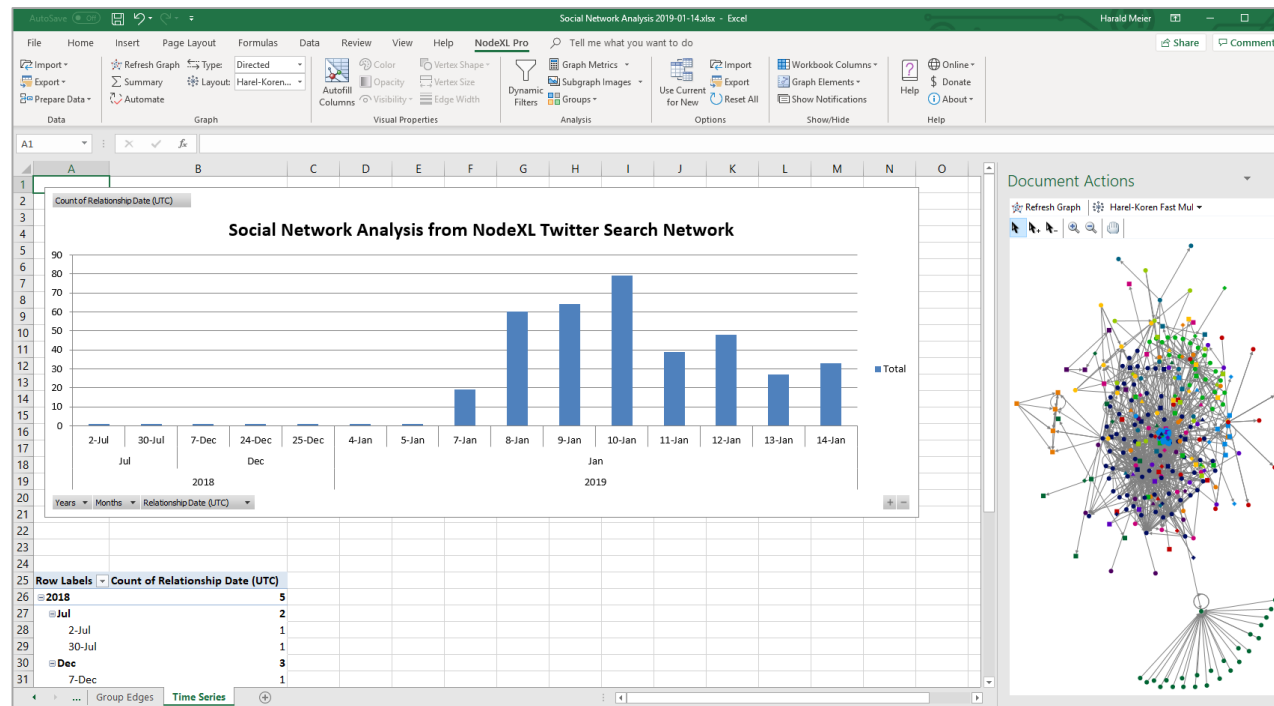
Options

☒ Unique edges by this column

Imported ID

4.

5. OK



7. Text / Sentiment Analysis

About this Tutorial

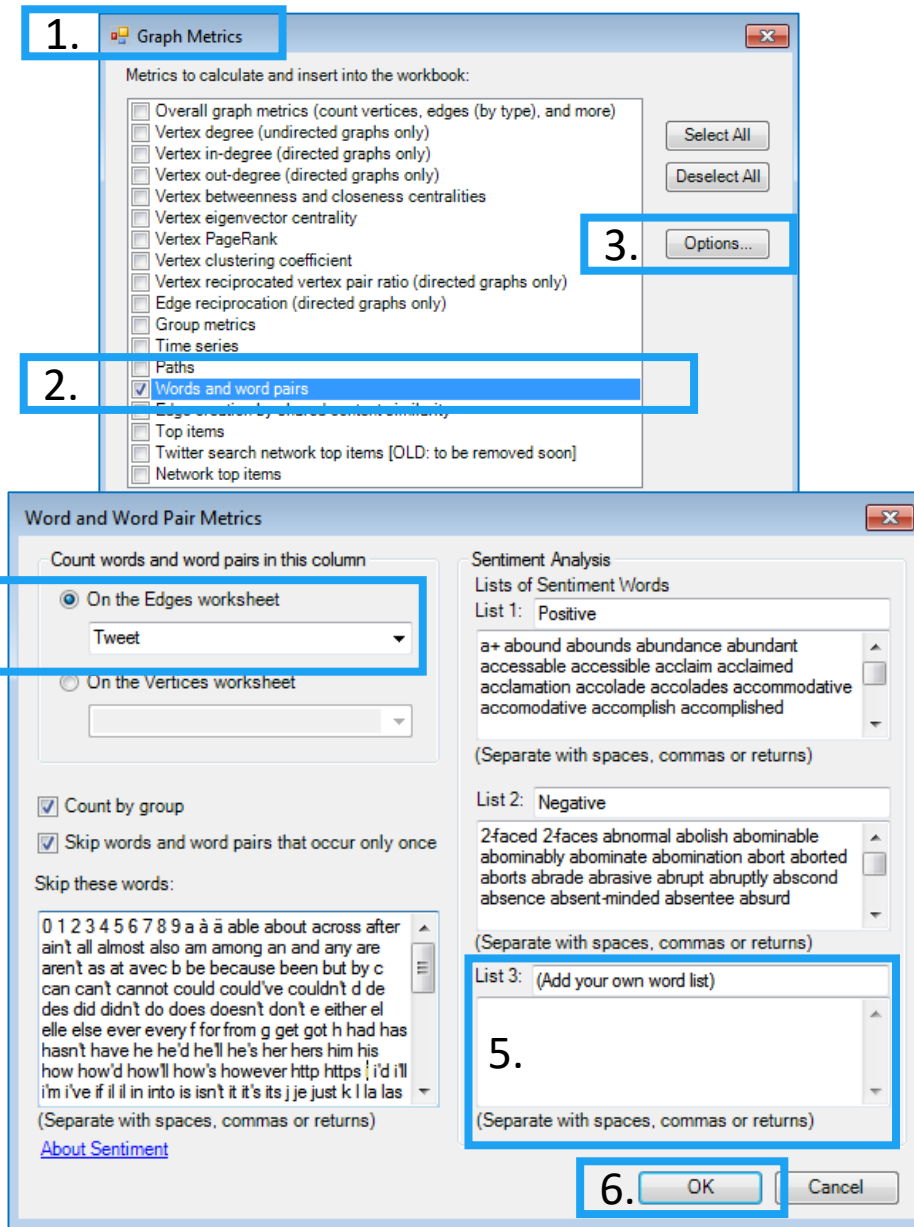
1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

NodeXL Pro is shipped with a skip word list as well as a positive and a negative sentiment words list in English language. These lists can be modified to your needs.

This feature counts the frequency of words and word pairs in a text column. At the same time any word is checked for occurrence in one of the sentiment lists.

1. Open the Graph Metrics window: **Analysis > Graph Metrics > Graph Metrics**
2. Deselect everything but **Words and Word Pairs**.
3. Click on **Options...** to open the **Word and Word Pair Metrics** window.
4. Choose column **Tweet**.
5. Optional: Enter your own list of keywords into **List 3**.
6. Click **OK** and then **Calculate Metrics**.
7. Take a look at the two new spreadsheets **Words** and **Word Pairs** that have just been created. Further, sentiment related columns have been added to the **Edges** and **Vertices** spreadsheets.



8. Network Top Items

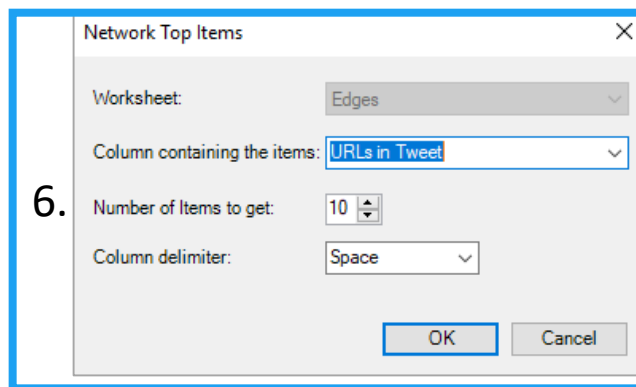
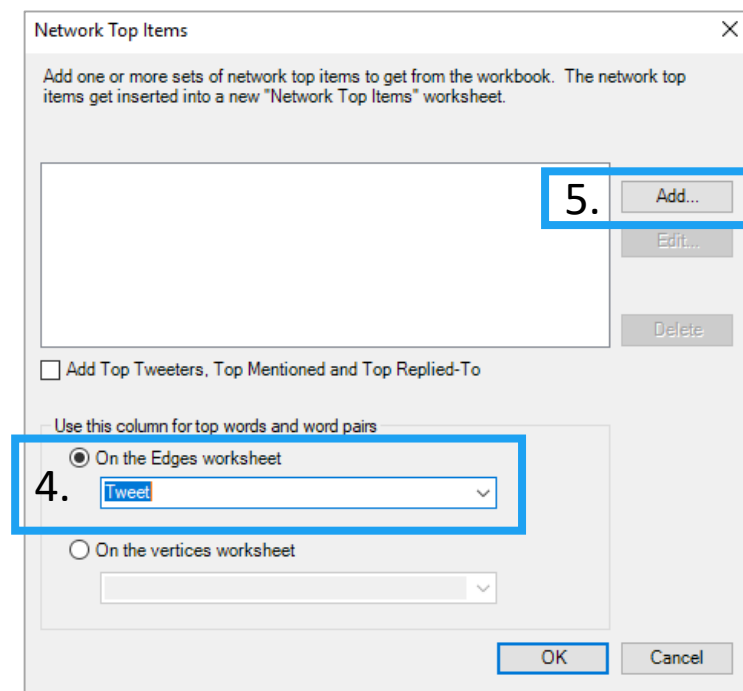
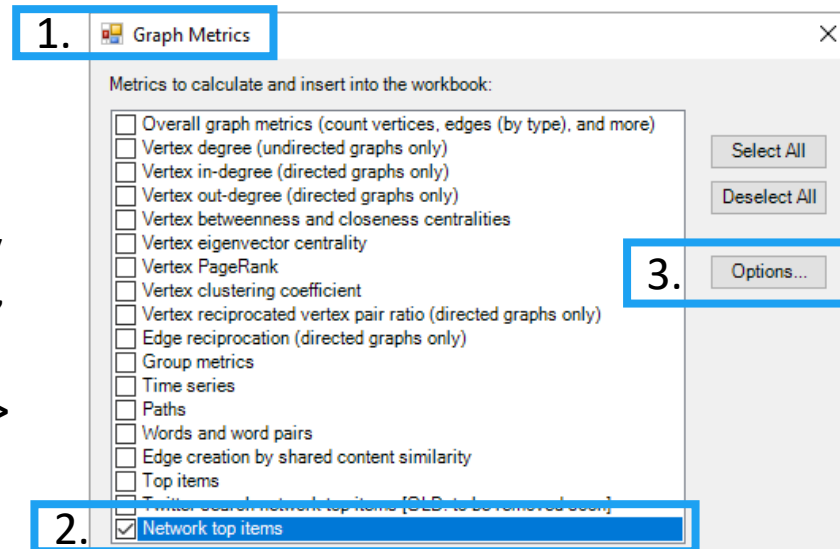
This feature summarizes the top contents of the network data by collecting the most frequently occurring URLs, domains, hashtags, words and word pairs from the Edges worksheet.

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
- 8. Network Top Items**
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

1. Open the Graph Metrics window: **Analysis > Graph Metrics > Graph Metrics**
2. Deselect everything but **Network Top Items**.
3. Click on **Options...** to open the **Network Top Items** window.
4. Select **Tweet** to collect top words and word pairs from the Edges worksheet).
5. Click on **Add...** to open the window below.
6. Select the column **URLs in Tweet**, choose the number of items to get and set the column delimiter to **Space**. Click **OK**.



About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
- 8. Network Top Items**
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

8. Network Top Items

7. Repeat step six from the previous page for columns **Domains in Tweet** and **Hashtags in Tweet**.
8. When the **Network Top Items** window looks like the one on the right, click **OK** and then **Calculate Metrics**. This step may take a few minutes.
9. Have a look at the new worksheet **Network Top items**.

The screenshot shows the NodeXL Pro Excel interface. The 'Network Top Items' dialog box is open, showing the 'Top Hashtags in Tweet' worksheet. The 'Add Top Tweeters, Top Mentioned and Top Replied-To' checkbox is checked. The 'Use this column for top words and word pairs' section has 'On the Edges worksheet' selected, with 'Tweet' in the dropdown. The 'OK' button is highlighted with a red box and the number '8.'. Below the dialog box, the 'Network Top Items' worksheet is visible, showing a table with columns for 'Top Hashtags in Tweet in Entire Graph', 'Top Hashtags in Tweet in G1', 'G1 Count', 'Top Hashtags in Tweet in G2', and 'G2'. The table contains data for various hashtags and their counts. The 'Network Top Items' worksheet is also visible, showing a table with columns for 'Top Words in Tweet in Entire Graph', 'Top Words in Tweet in G1', 'G1 Count', 'Top Words in Tweet in G2', and 'G2'. The table contains data for various words and their counts. The 'Network Top Items' worksheet is also visible, showing a table with columns for 'Top Words in Tweet in Entire Graph', 'Top Words in Tweet in G1', 'G1 Count', 'Top Words in Tweet in G2', and 'G2'. The table contains data for various words and their counts.

Top Hashtags in Tweet in Entire Graph	Top Hashtags in Tweet in G1	G1 Count	Top Hashtags in Tweet in G2	G2
bigdata	digitalmarketing	27	caqdas	27
dataviz	iot	27	nvivo	27
digitalmarketing	bigdata	27	plus	27
iot	dataanalytics	27	cyberwarfare	27
dataanalytics	dataviz	27	infosec	27
datascience	datascience	25	research	25
influencer	influencer	25	edtech	25
infographic	infographic	25	tuberculosis	25
الإعلام الاجتماعي	ai	22	investigation	5
advancedtraining	deeplear	10	drugresistant	4

Top Words in Tweet in Entire Graph	Top Words in Tweet in G1	G1 Count	Top Words in Tweet in G2	G2
Words in Sentiment List#1: Positive	gt	173	network	742
Words in Sentiment List#2: Negative	social	61	social	267
Words in Sentiment List#3: (Add your c	mikequindazzi	0	analysis	152
Non-categorized Words	network	11260	nvivo	137
Total Words	analysis	11494	12	136
gt	nodexl	746	plus	136
social	bigdata	482	windows	133
network	process	389	analyst	132
analysis	investigating	369	data	132
nodexl	174	174	job	132

9. Autofill Columns

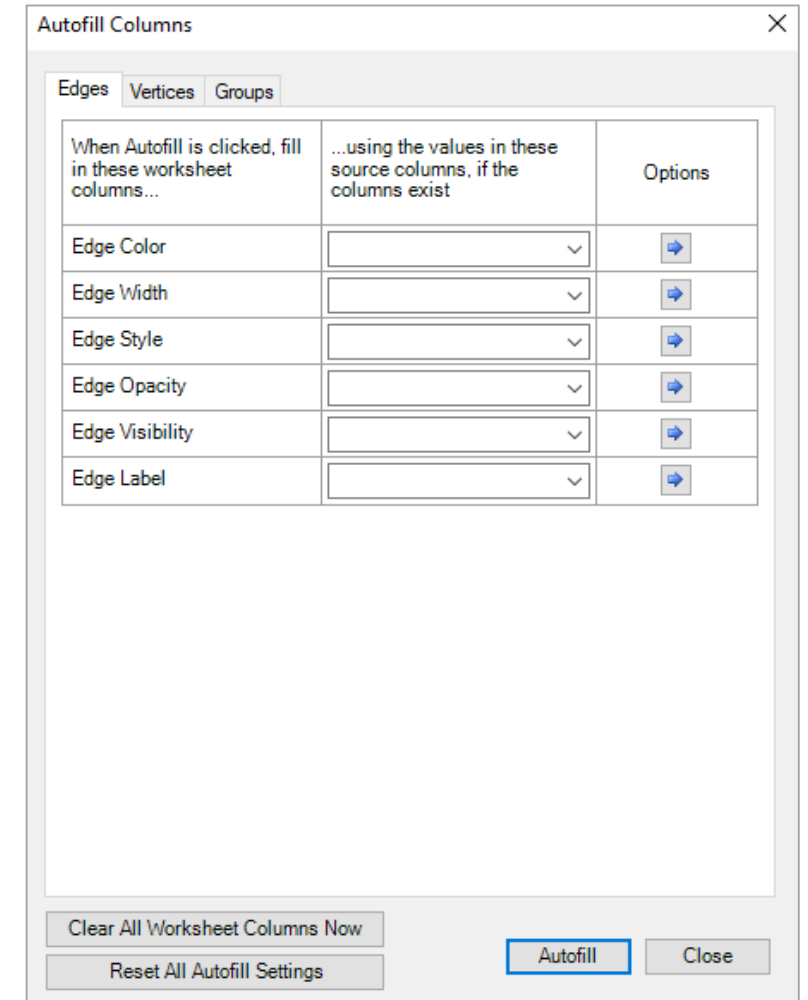
About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
- 9. Autofill columns**
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

Based on the previous calculations, we will now start with the visualization. The **Autofill Columns** feature helps to fill a number of columns with a few clicks.

1. Go to **Visual Properties > Autofill columns** to open the Autofill Columns window seen on the right.
2. Choose source columns and set the options for **Edges, Vertices and Groups** as shown on the next three pages.



The image shows the 'Autofill Columns' dialog box with the 'Edges' tab selected. It contains a table for configuring autofill options for edges, vertices, and groups. The table has three columns: 'When Autofill is clicked, fill in these worksheet columns...', '...using the values in these source columns, if the columns exist', and 'Options'. The 'Edges' tab is active, showing options for Edge Color, Edge Width, Edge Style, Edge Opacity, Edge Visibility, and Edge Label. Each option has a dropdown menu for source columns and a button to apply the autofill.

When Autofill is clicked, fill in these worksheet columns...	...using the values in these source columns, if the columns exist	Options
Edge Color	<input type="text"/>	<input type="button" value="→"/>
Edge Width	<input type="text"/>	<input type="button" value="→"/>
Edge Style	<input type="text"/>	<input type="button" value="→"/>
Edge Opacity	<input type="text"/>	<input type="button" value="→"/>
Edge Visibility	<input type="text"/>	<input type="button" value="→"/>
Edge Label	<input type="text"/>	<input type="button" value="→"/>

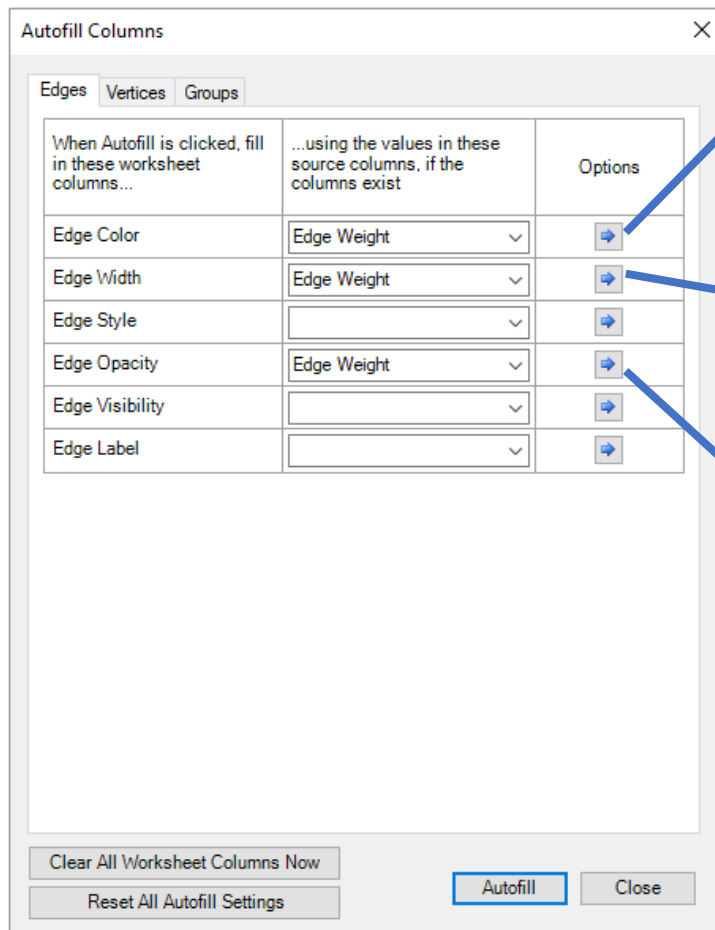
At the bottom of the dialog, there are three buttons: 'Clear All Worksheet Columns Now', 'Reset All Autofill Settings', and 'Autofill' (highlighted with a blue border). A 'Close' button is also present.

9. Autofill Columns: Edges







About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
- 9. Autofill columns**
10. Customize graph
11. Save the network map
12. Automation

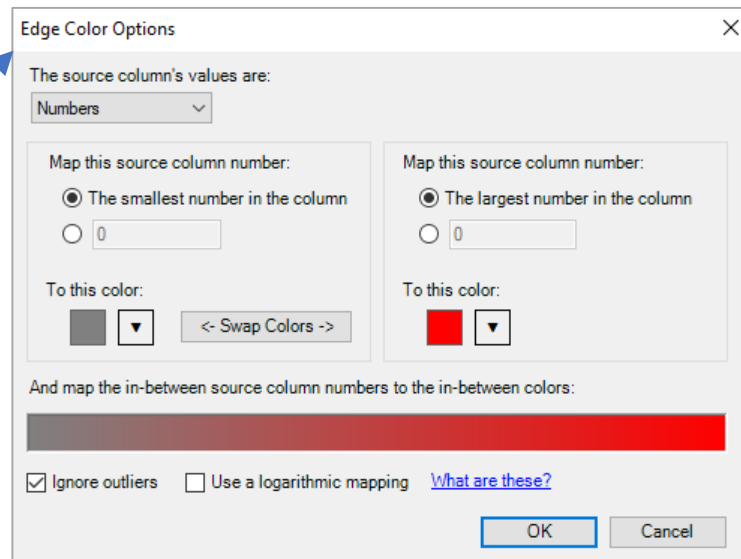
Literature/Links



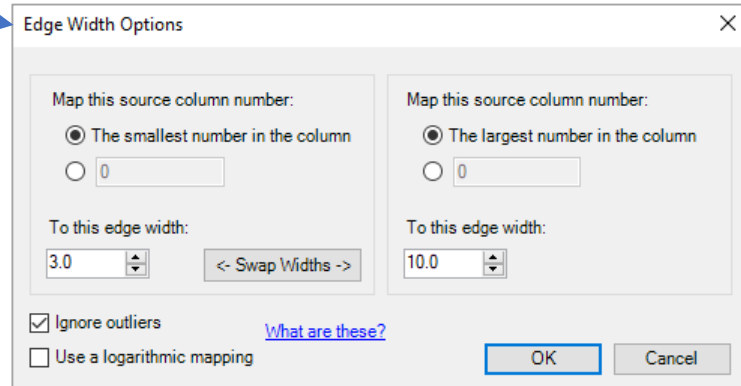
The 'Autofill Columns' dialog box has three tabs: 'Edges', 'Vertices', and 'Groups'. The 'Edges' tab is active. It contains a table with columns: 'When Autofill is clicked, fill in these worksheet columns...', '...using the values in these source columns, if the columns exist', and 'Options'. The table lists various edge properties and their corresponding source columns and options.

When Autofill is clicked, fill in these worksheet columns...	...using the values in these source columns, if the columns exist	Options
Edge Color	Edge Weight	
Edge Width	Edge Weight	
Edge Style		
Edge Opacity	Edge Weight	
Edge Visibility		
Edge Label		

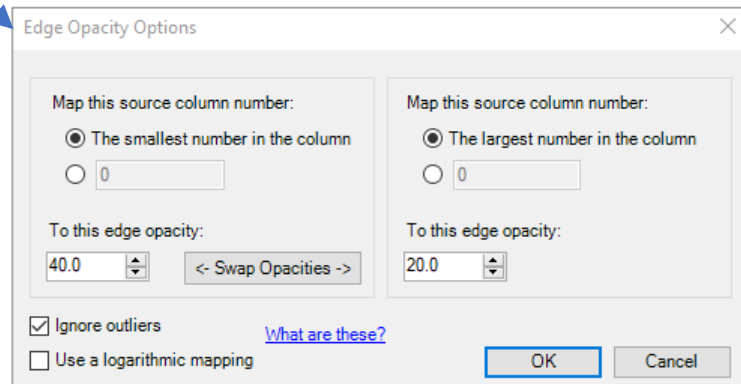
At the bottom of the dialog are buttons for 'Clear All Worksheet Columns Now', 'Reset All Autofill Settings', 'Autofill', and 'Close'.



The 'Edge Color Options' dialog box shows mapping options for edge color. It includes a dropdown for 'The source column's values are:' set to 'Numbers'. There are two mapping options: 'The smallest number in the column' and 'The largest number in the column', both with a '0' input field. Each mapping has a 'To this color:' section with a color swatch and a 'Swap Colors' button. A color gradient bar is shown at the bottom. Checkboxes for 'Ignore outliers' and 'Use a logarithmic mapping' are present, along with a 'What are these?' link and 'OK/Cancel' buttons.



The 'Edge Width Options' dialog box shows mapping options for edge width. It includes a dropdown for 'The source column's values are:' set to 'Numbers'. There are two mapping options: 'The smallest number in the column' and 'The largest number in the column', both with a '0' input field. Each mapping has a 'To this edge width:' section with a numerical input field (3.0 and 10.0 respectively) and a 'Swap Widths' button. Checkboxes for 'Ignore outliers' and 'Use a logarithmic mapping' are present, along with a 'What are these?' link and 'OK/Cancel' buttons.



The 'Edge Opacity Options' dialog box shows mapping options for edge opacity. It includes a dropdown for 'The source column's values are:' set to 'Numbers'. There are two mapping options: 'The smallest number in the column' and 'The largest number in the column', both with a '0' input field. Each mapping has a 'To this edge opacity:' section with a numerical input field (40.0 and 20.0 respectively) and a 'Swap Opacities' button. Checkboxes for 'Ignore outliers' and 'Use a logarithmic mapping' are present, along with a 'What are these?' link and 'OK/Cancel' buttons.

9. Autofill Columns: Vertices

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
- 9. Autofill columns**
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

Autofill Columns

Edges Vertices Groups

When Autofill is clicked, fill in these worksheet columns...	...using the values in these source columns, if the columns exist	Options
Vertex Color		
Vertex Shape		
Vertex Size:	Betweenness Centrality	
Vertex Opacity		
Vertex Visibility		
Vertex Label	Vertex	
Fill Color		
Vertex Label Position		
Vertex Tooltip		
Vertex Layout Order	Betweenness Centrality	
Vertex X		
Vertex Y		
Vertex Polar R		
Vertex Polar Angle		

Clear All Worksheet Columns Now
Reset All Autofill Settings
Autofill
Close

Vertex Size Options

Map this source column number:
☒ The smallest number in the column
☐ 0

Map this source column number:
☒ The largest number in the column
☐ 0

To this vertex size:
100.0

To this vertex size:
1,000.0

☒ Ignore outliers [What are these?](#)
☐ Use a logarithmic mapping

OK
Cancel

Vertex Layout Order Options

Map this source column number:
☒ The smallest number in the column
☐ 0

Map this source column number:
☒ The largest number in the column
☐ 0

To this vertex layout order:
1.0

To this vertex layout order:
9,999.0

☐ Ignore outliers [What are these?](#)
☐ Use a logarithmic mapping

OK
Cancel

9. Autofill Columns: Groups

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
- 9. Autofill columns**
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

Autofill Columns

Edges Vertices **Groups**

When Autofill is clicked, fill in these worksheet columns...	...using the values in these source columns, if the columns exist	Options
Group Collapsed?		<input type="button" value="➡"/>
Label	Top Words in Tweet	<input type="button" value="➡"/>

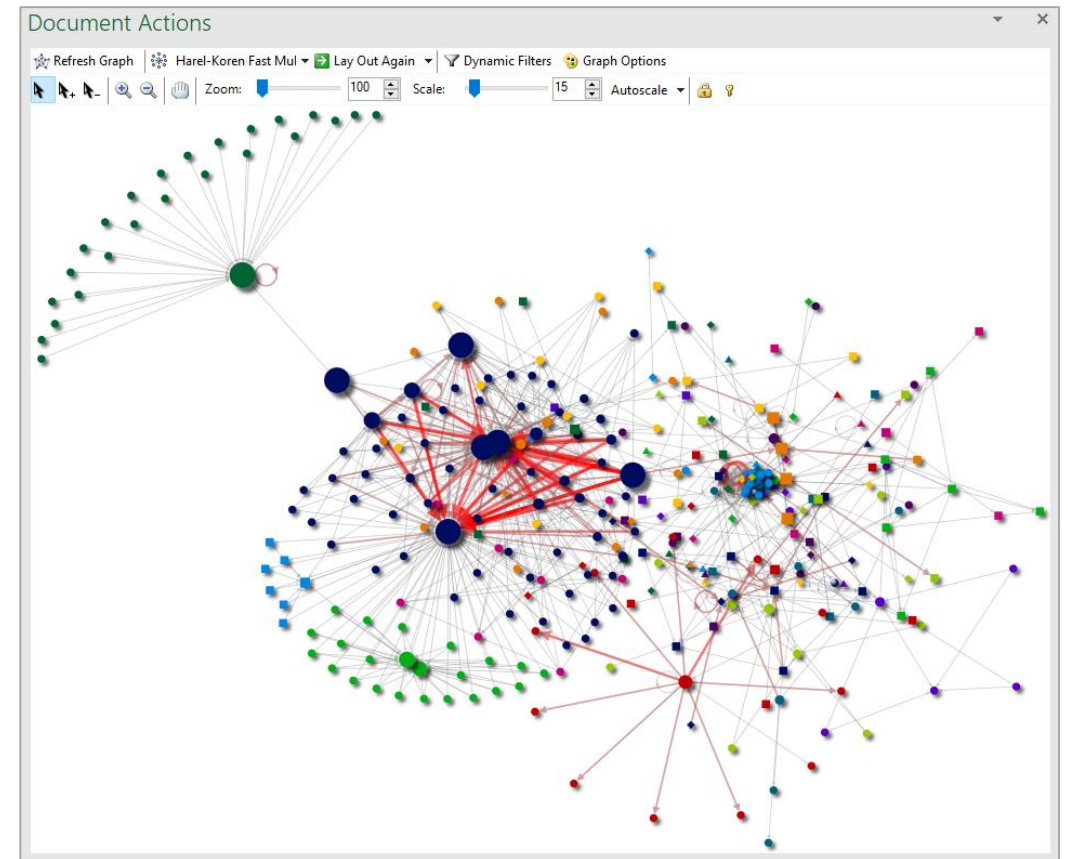
Group Label Options

☒ Prepend the label with the group name

OK Cancel

3. Close

3. When all options are set, click **Autofill**.
4. Wait. This step may take up to a few minutes. The graph will automatically refresh.



10. Customize Graph: Layout Options

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
- 10. Customize graph**
11. Save the network map
12. Automation

Literature/Links

1. Open the **Layout Options** window: **Graph > Layout > Layout Options**
2. Set the **Layout style** to: **Lay out each of the graph's groups in ist own box.**
3. Set the **Box layout algorithm** to: **Treemap.**
4. Click **OK** and then **Lay Out Again.**

The screenshot displays the NODE Pro software interface. On the left, the 'Document Actions' menu is open, showing various options including 'Refresh Graph', 'Harel-Koren Fast Mul', and 'Lay Out Again'. A blue box highlights the 'Lay Out Again' option, labeled with a '1.'. In the center, the 'Layout Options' dialog box is open. It has a 'Margin' of 5. Under 'Layout style', the radio button for 'Lay out each of the graph's groups in its own box' is selected, labeled with a '2.'. Below this, the 'Box layout algorithm' is set to 'Treemap', labeled with a '3.'. The 'Document Actions' menu is also open on the right, showing the 'Lay Out Again' option highlighted with a blue box and labeled with a '4.'. The background shows a network graph with various nodes and edges.

10. Customize Graph: Add Images to Vertices

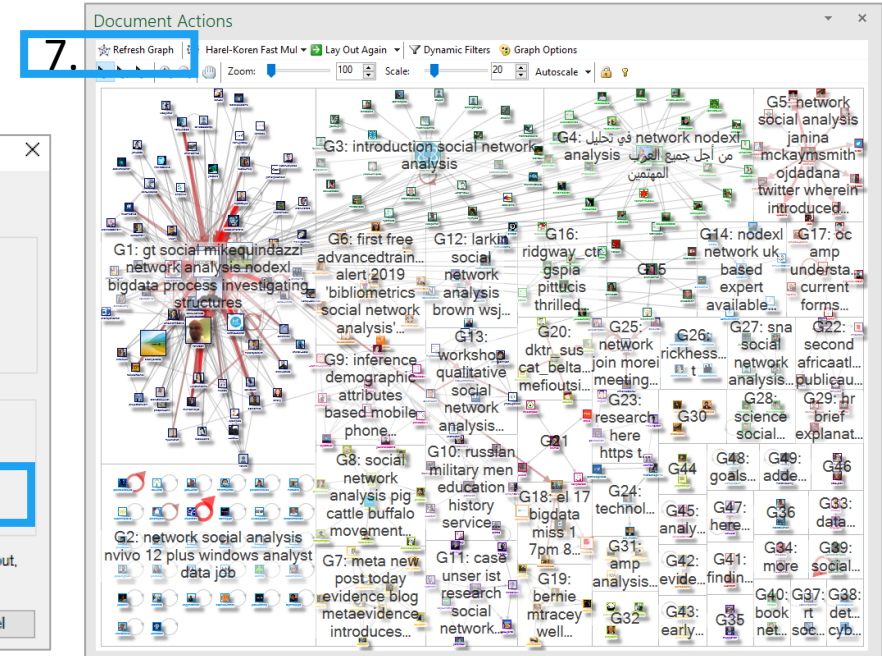
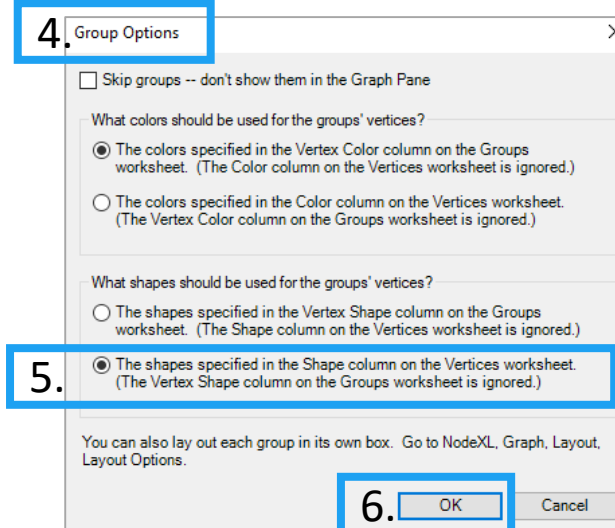
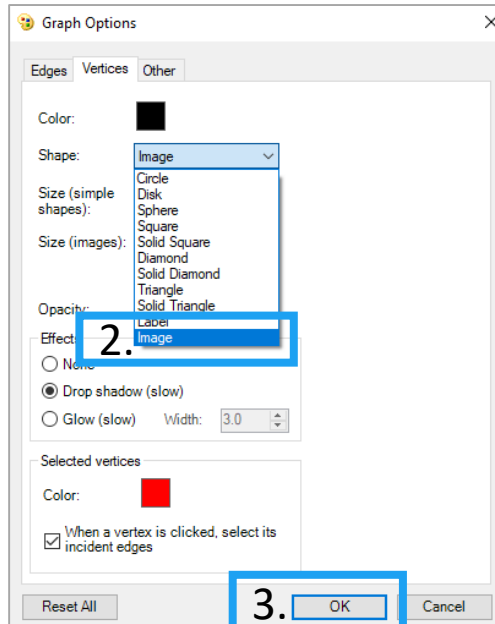
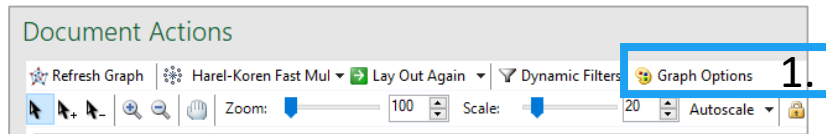
About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
- 10. Customize graph**
11. Save the network map
12. Automation

Literature/Links

1. Open the **Graph Options** window.
2. Go to page **Vertices** and set the **Vertex Shape** to **Image**.
3. Click **OK**.

4. Open the Group Options window: **Analysis > Groups > Group Options**
5. Set the option: **The shapes specified in the Shape column on the Vertices worksheet.**
6. Click **OK**.
7. Click **Refresh Graph**.



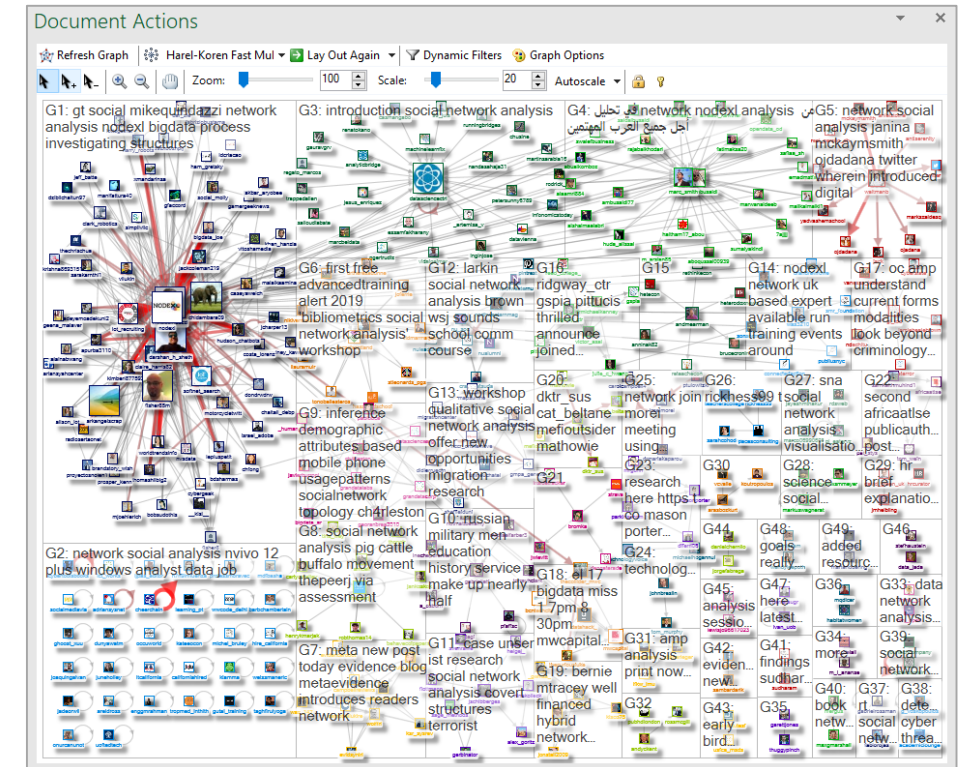
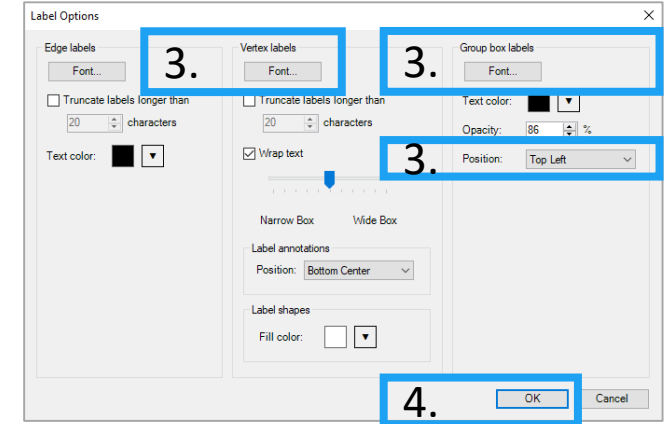
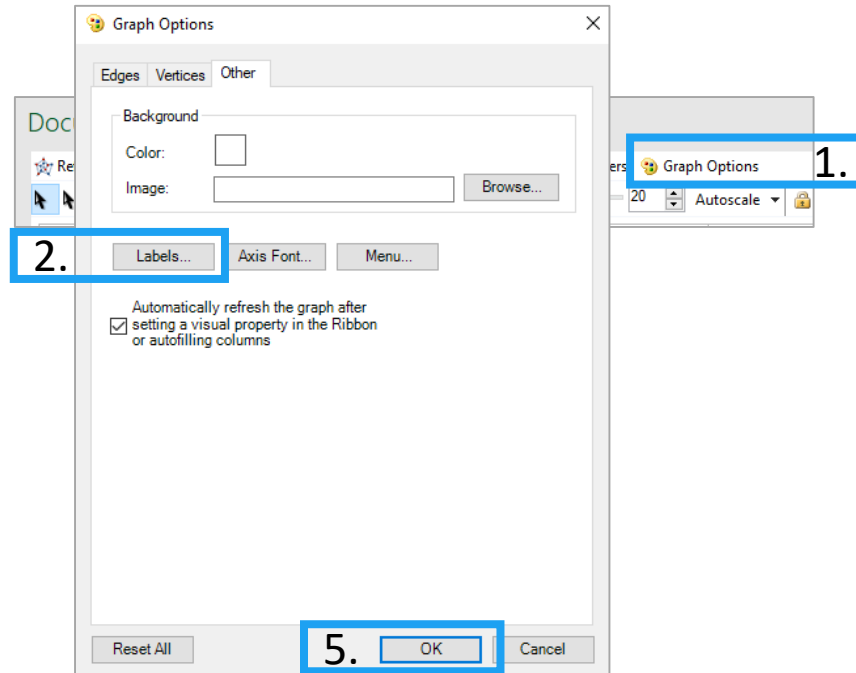
10. Customize Graph: Label Options

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
- 10. Customize graph**
11. Save the network map
12. Automation

Literature/Links

1. Open the **Graph Options** window above the graph pane.
2. Go to page **Other** and click on **Labels** to open the **Label Options Window**.
3. Customize the position, font and size of vertex and group box labels.
4. Click **OK** to close the Label Options window.
5. Then click **OK** to close the graph options.



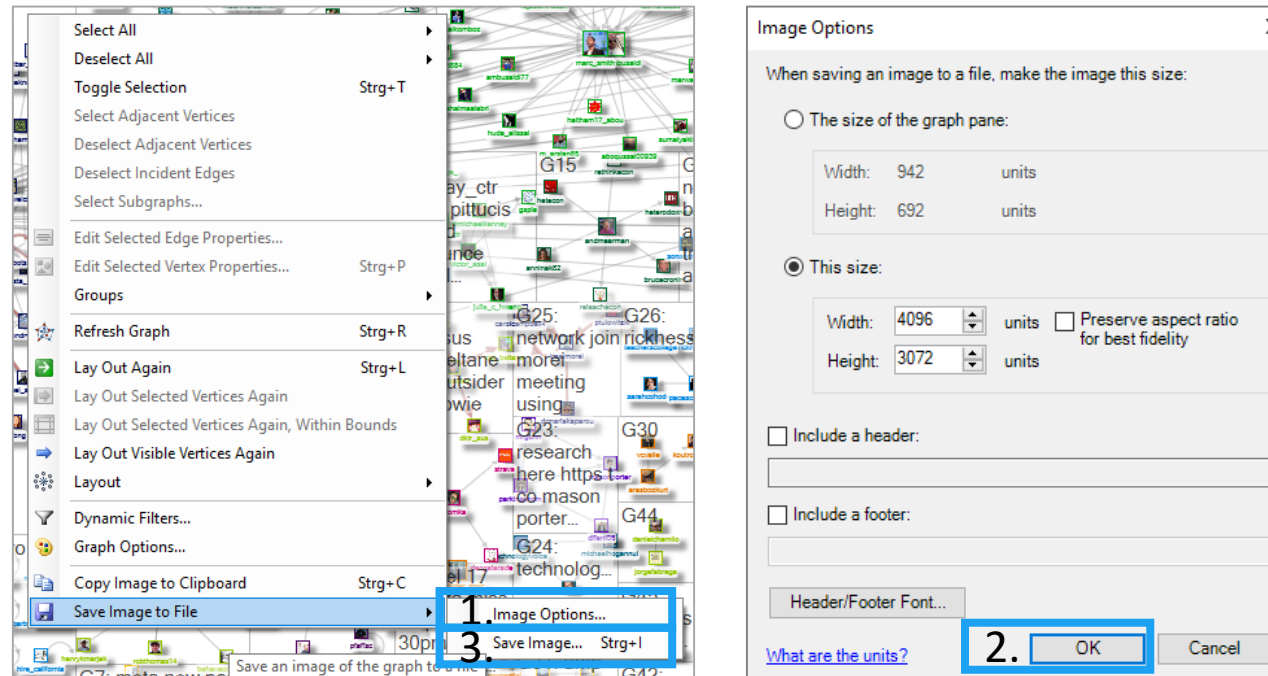
11. Save the Network Map as Image

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
- 11. Save the network map**
12. Automation

Literature/Links

1. To open the Image Options window, right-click in the graph window, then select **Image Options...**
2. Customize the options and click **OK**.
3. Right-click in the graph window and then select **Save Image...**



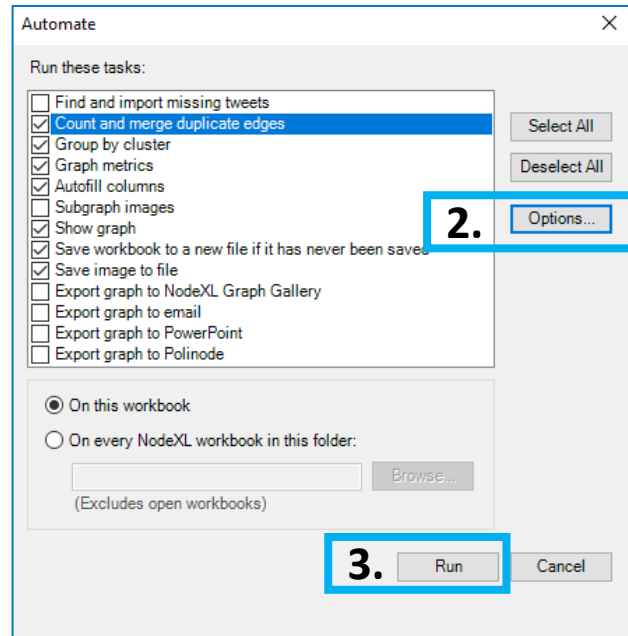
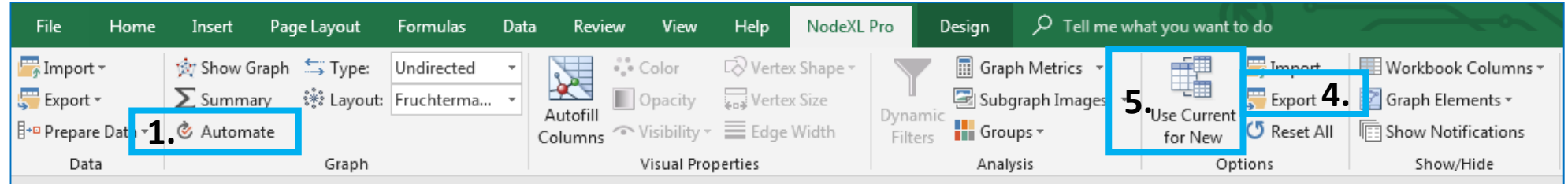
Congratulations! You have successfully analyzed and visualized Twitter network data.

12. Automation

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links



You can automate all previous steps with the **Automation** feature:

1. Open the Automation window: **Graph > Automate**.
2. Set the **Options...** for each task.
3. Click **Run** and wait.
4. Click **Options > Export** to save your customized **Data Recipe**.

Learn more about automating NodeXL Pro:

NodeXL Pro Tutorial (pdf): How to automate NodeXL Pro

- <https://www.smrfoundation.org/nodexl/tutorials>

NodeXL Pro Video Tutorial on Automation

- <https://www.youtube.com/watch?v=mjAq8eA7uOM>

Links and Literature

About this Tutorial

1. Getting Started
2. Data import
3. Prepare data
4. Group by cluster
5. Calculate metrics
6. Time series analysis
7. Text/sentiment analysis
8. Network Top Items
9. Autofill columns
10. Customize graph
11. Save the network map
12. Automation

Literature/Links

Useful Links

Social Media Research Foundation: <http://www.smrfoundation.org/>

NodeXL Graph Gallery: <https://nodexlgraphgallery.org/>

Video: Marc Smith | Network Mapping the Ecosystem: <https://www.youtube.com/watch?v=kDiGl-2m868>

Viedo: How to Automate NodeXL Pro: <https://www.youtube.com/watch?v=mjAq8eA7uOM>

Twittter search operators: <https://developer.twitter.com/en/docs/tweets/rules-and-filtering/overview/standard-operators>

Literature

Derek Hansen, Ben Shneiderman and Marc Smith (2009): Analyzing Social Media Networks with NodeXL: <https://www.elsevier.com/books/analyzing-social-media-networks-with-nodexl/hansen/978-0-12-382229-1>

Eduarda Mendes Rodrigues, Natasa Milic-Frayling, Marc Smith, Ben Shneiderman, Derek Hansen (2011): Group-in-a-box Layout for Multi-faceted Analysis of Communities. In: IEEE Third International Conference on Social Computing, October 9-11, 2011. Boston, MA: <https://www.cs.umd.edu/hcil/trs/2011-24/2011-24.pdf>

Marc A. Smith, Lee Rainie, Ben Shneiderman and Itai Himelboim (2014): Mapping Twitter Topic Networks: From Polarized Crowds to Community Clusters. PEW Research Report: <https://www.pewinternet.org/2014/02/20/mapping-twitter-topic-networks-from-polarized-crowds-to-community-clusters/>

Itai Himelboim, Marc A. Smith, Lee Rainie, Ben Shneiderman and Camila Espina: Classifying Twitter Topic-Networks Using Social Network Analysis. In: Social Media + Society (January-March 2017: 1 –13). <https://journals.sagepub.com/doi/full/10.1177/2056305117691545>

Borgatti, Stephen P. (2006): Identifying sets of key players in a social network. In: Comput Math Organiz Theor (2006) 12: 21–34

Aaron Clauset, M. E. J. Newman, and Cristopher Moore (2004): Finding community structure in very large networks. In: Phys. Rev. E 70.