VOSON Dashboard Userguide For version 0.131 (10Sep18)

Xiaolan Cai¹, Robert Ackland¹, and Bryan Gertzel¹

¹VOSON Lab, Australian National University

Draft 25 September 2018

Contents

| 1 | Intr | oduction | 3 |
|---|------|--|---|
| | 1.1 | VOSON Dashboard | 3 |
| | | 1.1.1 Credits | 3 |
| | | 1.1.2 Citing VOSON Dashboard | 3 |
| | 1.2 | About this guide | 3 |
| 2 | Star | rting with VOSON Dashboard | 4 |
| | 2.1 | Downloading the application | 4 |
| | 2.2 | Preliminaries | 4 |
| | 2.3 | Steps for running VOSON Dashboard in RStudio | 4 |
| | 2.4 | User interface | 5 |
| | | 2.4.1 Home | 5 |
| | | 2.4.2 Network Graphs | 5 |
| | | 2.4.3 Network Metrics | 5 |
| | | 2.4.4 Text Analysis | 5 |
| | | 2.4.5 Assortativity | 5 |
| | | 2.4.6 Twitter | 5 |
| | | 2.4.7 YouTube | 6 |
| | | 2.4.8 API Keys | 6 |
| 3 | Net | work analysis with VOSON Dashboard | 7 |
| | 3.1 | Workign with networks | 7 |
| | | 3.1.1 Network visualization | 7 |
| | | 3.1.2 Viewing the network data | 8 |
| | | 3.1.3 Manipulating the network | 8 |
| | | 3.1.4 Saving networks | 8 |
| | 3.2 | Network metrics | 9 |
| | 3.3 | Assortativity | 9 |
| 4 | Text | t analysis with VOSON Dashboard | 9 |
| | 4.1 | Text filters | 9 |

| | · · · · · · · · · · · · · · · · · · · |
|--|---|
| hboard | 13 |
| | |
| | |
| | |
| | |
| 3e | 14 |
| | 14 |
| ter database \ldots \ldots \ldots \ldots \ldots \ldots | 14 |
| | 14 |
| | 14 |
| se | |
| | |
| l YouTube data | |
| se | |

List of Figures

| 1 | Steps to load VOSON Dashboard in RStudio 4 |
|----|---|
| 2 | The interface on startup |
| 3 | Load graphml data |
| 4 | The Network Graphs window |
| 5 | The vertices table |
| 6 | The edges table |
| 7 | Manipulating network database |
| 8 | Text filters |
| 9 | Word frequency bar chart 11 |
| 10 | Word cloud |
| 11 | Comparison cloud |
| 12 | Input API keys directly in "Twitter" or "YouTube" menu 13 |
| 13 | Input, save and load API keys in "API Keys" window |
| 14 | YouTube Video ID |
| 15 | Searching in YouTube data |

1 Introduction

1.1 VOSON Dashboard

VOSON Dashboard is an R/Shiny application for collecting and analysing networks and associated text data. VOSON Dashboard builds on a number of R packages, in particular igraph (for network analysis) and VOSON SML. VOSON SML is an R package that provides a suite of tools for collecting and constructing networks from social media data. It provides easy-to-use functions for collecting data across popular platforms (Facebook, Twitter, and YouTube) and generating different types of networks for analysis.

1.1.1 Credits

Bryan Gertzel is the lead developer of VOSON Dashboard, with Robert Ackland also contributing to the software development. The user documentation has been written by Xiaolan Cai and Robert Ackland.

1.1.2 Citing VOSON Dashboard

1.2 About this guide

VOSON Dashboard continues to be developed and improved largely based on feedback from users. This guide will be updated as we improve VOSON Dashboard.

2 Starting with VOSON Dashboard

2.1 Downloading the application

VOSON Dashboard has not yet been publicly released: participants in workshops or courses will be given instructions on how to download a zip file.

2.2 Preliminaries

It is recommended to use VOSON Dashboard with RStudio. Several R packages are required to be installed prior to VOSON Dashboard, including but not limited to: vosonSML, igraph, Shiny, Shinydashboard, shinyjs, htmlwidgets, sourcetools, crosstalk, SnowballC, and wordcloud.

2.3 Steps for running VOSON Dashboard in RStudio

To run VOSON Dashboard from RStudio (Figure 1):

- 1. Click "File > Open File" to open the file named "ui.R";
- 2. Set your working directory by clicking "Session > Set Working Directory", usually "To Source File Location";
- 3. Then click "Run App" on the right top of the top left window in RStudio: after a few seconds the user interface will popup.



Figure 1: Steps to load VOSON Dashboard in RStudio

2.4 User interface

The navigator is on the left side, and the working space is on the right side. You can change working space by clicking menu items in the navigator (Figure 2).



Figure 2: The interface on startup

The following menu items are listed in the navigator.

2.4.1 Home

A brief introduction to VOSON Dashboard.

2.4.2 Network Graphs

Where you can visualise network graphs and modify networks (e.g. create subnetworks).

2.4.3 Network Metrics

Node- and network-level metrics, including visualizations of node-level metrics.

2.4.4 Text Analysis

Analysis of text data for nodes/edges in the network (when it exists).

2.4.5 Assortativity

The construction of homogeneity and homophily indexes (only for networks where nodes are categorised into groups).

2.4.6 Twitter

For collecting from Twitter.

2.4.7 YouTube

For collecting data from YouTube.

2.4.8 API Keys

For storing, loading and using API keys for Twitter and YouTube.

3 Network analysis with VOSON Dashboard

3.1 Workign with networks

The first step is to load a graphml file by clicking "Choose graphml file > Browse" in "Network Graphs" (Figure 3).



Figure 3: Load graphml data

3.1.1 Network visualization

The loaded network will be visualized with the default plot in the canvas on the right side. Three plot types are available: Plot, D3 force, D3 simple, but at present only the standard "plot" canvas provides full functionality (Figure 4)



Figure 4: The Network Graphs window

A brief summary of network metrics is shown.

"Filters" can be used to control the visualization of a network and to manipulate the network (Figure ??):

- Node names, multiple edges, loops and isolates can be shown or hidden.
- The layout of the visualization can be changed by choosing different layouts from "Graph Layout". The "Spread" bar controls the distances between nodes.
- The size of nodes can be made to reflect node-level metrics (e.g. indegree centrality or betweenness

centrality) via the "Node Size" checkbox. The "Multiplier" bar allows for control over the scaling of node size.

- The "Categorical Attribute" drop-box allows the visualization of subgroups (sets of nodes with common values of a categorical node attribute), when they exist. Colors are automatically assigned to nodes in different categories, and a second drop-box allows for subnetworks to be created based on particular values of the node categorical attribute.
- The "Connected Components" tool allows for the network to be filtered so only components matching particular criteria are included. For example, it is possible to filter the network so only nodes contained in components of size greater than 5 are included in the network. It is possible to filter the network using both "strong" and "weak" connected types. The "size" bar generate sub-networks containing components within certain size range by changing the minimum and maximum component size.

3.1.2 Viewing the network data

The vertex and edge data are shown in tables below the canvas Figure 5) and Figure 6. Nodes and edges can be sorted (e.g. sorting on indegree centrality) and it is possible to search for nodes/edges matching particular criteria (e.g. nodes with particular names).

| Vertices Edges | | | | | | | | Gi | aph Data |
|-----------------------------------|----------------|--------------------------------------|---|------|--------|------------|-------------|---------------|-----------|
|] Truncate text | | | | | | | | | |
| ihow 10 🔻 entries Copy | CSV Print | | | | | | Sear | ch: | |
| | vosonCA_Type 🖗 | name 🍦 | vosonTxt_metaKeywords 崇 | id (| Degree | Indegree 🔶 | Outdegree 🔶 | Betweenness 🔶 | Closeness |
| www.centerforfoodsafety.org/ | Bio | http://www.centerforfoodsafety.org/ | | n0 | 38 | 19 | 19 | 505.399 | 0.001 |
| www.mst.org.br/ | Bio | http://www.mst.org.br/ | | n1 | 6 | 5 | 1 | 7.591 | 0.000 |
| www.nwrage.org/ | Bio | http://www.nwrage.org/ | Northwest Resistance Against Genetic | n2 | 9 | 1 | 8 | 7.871 | 0.000 |
| www.organicconsumers.org/ | Bio | http://www.organicconsumers.org/ | | n3 | 48 | 21 | 27 | 1,032.668 | 0.001 |
| ngin.tripod.com/ | Bio | http://ngin.tripod.com/ | Aventis Bayer GE contamination GE fo | n4 | 23 | 4 | 19 | 82.129 | 0.001 |
| www.biodev.org/ | Bio | http://www.biodev.org/ | | n5 | 8 | 4 | 4 | 11.916 | 0.000 |
| angelsagainstnanotech.blogspo | Bio | http://angelsagainstnanotech.blogspo | | n6 | 0 | 0 | 0 | 0.000 | 0.000 |
| www.ifoam.org/ | Bio | http://www.ifoam.org/ | Africa Agriculture Asia BIO Certifie | n7 | 11 | 6 | 5 | 213.364 | 0.000 |
| /www.i-sis.org.uk/ Bio | | http://www.i-sis.org.uk/ | genetic gmo gm modified mae-wan mae | n8 | 36 | 15 | 21 | 462.291 | 0.003 |
| /www.ddsindia.com/www/default Bio | | http://www.ddsindia.com/www/default | Andhra Andhra Pradesh Deccan Designe | n9 | 8 | 3 | 5 | 8.637 | 0.00 |

Figure 5: The vertices table

3.1.3 Manipulating the network

There are two ways to manipulate networks: using "Filter" parameters (discussed above) and via "Pruning" to exclude particular nodes from the network.

3.1.4 Saving networks

It is possible to save a network to a graphml file by clicking the "Download Graphml" button.

| Vertices Edge | 25 | | | | | Graph | Data |
|----------------------|-------------|-------|----|---|----------|-------|----------|
| Truncate text | | | | | | | |
| Show 10 👻 entrie | es Copy CSV | Print | | | Search: | | |
| | from | \$ | to | ▼ | | w | reight 🔶 |
| 1 | | | | | | | 1 |
| 2 | | | | | | | 1 |
| 3 | | | | | | | 1 |
| 4 | | | | | | | 1 |
| 5 | | | | | | | 2 |
| 6 | | | | | | | 2 |
| 7 | | | | | | | 1 |
| 8 | | | | | | | 1 |
| 9 | | | | | | | 1 |
| 10 | | | | | | | 1 |
| Showing 1 to 10 of 2 | 20 entries | | | | Previous | 1 2 | Next |



3.2 Network metrics

The main network-level metrics are displayed, as well as bar charts component distribution, degree distribution (only for undirected network), indegree distribution and outdegree distribution (only for directed network).

3.3 Assortativity

For network with subgroups, the computation of homogeneity and homophily indexes are shown.

4 Text analysis with VOSON Dashboard

For a network with text fields (either node or edge attributes), it is possible to conduct basic text analysis.

At present, VOSON Dashboard provides two types of text analysis: word frequency bar charts and word clouds. For network with subgroups, a comparison word cloud will also be generated.

4.1 Text filters

The "Filters" controls allow you to filter and manipulate the text before analysis (Figure 8):

- "Remove standard stopwords": this removes (English) stopwords such as "and", "the", and "but".
- "User-define stopwords": here you can create your own list of stopwords (use commas or spaces between stopwords.
- "Apply word stemming": this attempts to reduce words to their stems.
- When you are working with a Twitter network, two other options are available: "Remove Twitter hashtags" and "Remove Twitter Usernames".

4.2 Visualizing word frequencies

Below the "Filters" is a summary of text analysis results, including text attributes, stopwords, and word counts for all and each category.

| Vertices Edges | | | | | | | | Graph | Data |
|---|---|---|---|--|---|---|--|--|--|
| Truncate text | | | | | | | | | |
| Show 10 • entries Copy CSV | Print | | | | | | Search: | | |
| | vosonCA_Type | name | vosonTxt_metaKeywords 🗍 | id 🔶 | Degree 🔶 | Indegree 🔶 | Outdegree 🔶 | Betweenness 🔶 | Closer |
| http://www.centerforfoodsafety.org/ | Bio | http://www.centerforfoodsafety.org/ | | n0 | 38 | 19 | 19 | 505.399 | |
| http://www.mst.org.br/ | Bio | http://www.mst.org.br/ | | n1 | 6 | 5 | 1 | 7.591 | |
| http://www.nwrage.org/ | Bio | http://www.nwrage.org/ | Northwest Resistance | n2 | 9 | 1 | 8 | 7.871 | |
| http://www.organicconsumers.org/ | Bio | http://www.organicconsumers.org/ | - Bannar o checteni | n3 | 48 | 21 | 27 | 1.032.668 | |
| http://ngin.tripod.com/ | Bio | http://ngin.tripod.com/ | Aventis Bayer GE | n4 | 23 | 4 | 19 | 82.129 | |
| http://www.biodev.org/ | Bio | http://www.biodev.org/ | containination of 10 | n 5 | 8 | A | 4 | 11 916 | |
| http://angelsagainstnanotech.blogspo | Bio | http://angelsagainstnanotech.blogspo | | n6 | 0 | | | 0.000 | |
| | 510 | http://angeosgamachanoccemacogopom | Africa Agriculture Asia BIO | | | , in the second s | Ŭ | 0.000 | |
| http://www.ifoam.org/ | Bio | http://www.ifoam.org/ | Certifie | n7 | 11 | 6 | 5 | 213.364 | |
| http://www.i-sis.org.uk/ | Bio | http://www.i-sis.org.uk/ | genetic gmo gm modified mae-wan mae | n8 | 36 | 15 | 21 | 462.291 | |
| http://www.ddsindia.com/www/default | . Bio | http://www.ddsindia.com/www/default | Andhra Andhra Pradesh Deccan Designe | n9 | 8 | 3 | 5 | 8.637 | |
| • | | 111 | | | | | | | 4 |
| Showing 1 to 10 of 161 entries | | | P | revio | us 1 | 2 3 | 4 5 | 17 | Next |
| Pruned Nodes | | Deselect All | | | | | | | |
| | | Prune Selected | | | | | | | |
| | | Prune Linselected | | | | | | | |
| | | * | | | | | | | |
| Un-prune Selected Reset | | | | | | | | | |
| | | | _ | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| | | | | | | | | | |
| Vertices Edges | | | | | | | | Graph | n Data |
| Vertices Edges | | | | | | | | Graph | n Data |
| Vertices Edges | | | | | | | | Graph |) Data |
| Vertices Edges Vertices Edges Truncate text Show 10 • entries Copy CSV | Print | | | | | | Search: | Graph |) Data |
| Vertices Edges Truncate text Show 10 entries Copy CSV | Print vosonCA_Type ≑ | name | vosonTxt_metaKeywords | id≑ | Degree 🛓 | Indegree 🕏 | Search: | Graph | Data |
| Vertices Edges Truncate text Show 10 • entries Copy CSV http://www.centerforfoodsafety.org/ | Print vosonCA_Type ∳ Bio | name 🔶 | vosonTxt_metaKeywords | id n0 | Degree ≑ 36 | Indegree + | Search: Outdegree | Graph Betweenness 3 507.29 | Data |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ | Print vosonCA_Type Bio Bio | name 🔶 http://www.centerforfoodsafety.org/ http://www.mst.org.br/ | vosonTxt_metaKeywords ∉ | id n0 n1 | Degree ♦ 36 6 | Indegree \$ | Search: | Graph Betweenness 3 507.29 4 7.40 | Close |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ | Print VosonCA_Type ∳ Bio Bio Bio | name 🔶 http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ | vosonTxt_metaKeywords Northwest Resistance Against Genetic | id (n0 n1 n2 | Degree ♦ 36 6 8 | Indegree \$ 18 5 1 | Search: Outdegree | Graph Betweenness 3 507.29 1 7.40 7 7.88 | Close |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.nwr.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ | Print VosonCA_Type Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ | vosonTxt_metaKeywords Northwest Resistance Against Genetic | id ∉ n0 n1 n2 n3 | Degree ∳ 36 6 8 46 | Indegree ∳ 18 5 1 20 | Search: | Graph Betweenness 3 507.29 1 7.40 7 7.88 3 993.34 | Close |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.nwrage.org/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ | Print VosonCA_Type ♦ Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ | vosonTxt_metaKeywords Northwest Resistance Against Genetic | id (n0 n1 n2 n3 n5 | Degree ∳ 36 6 8 46 8 | Indegree | Search: | Graph Betweenness 3 507.29 1 7.40 7 7.88 3 993.34 4 11.81 | Close Close |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo | Print VosonCA_Type Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo | vosonTxt_metaKeywords Northwest Resistance Against Genetic | id n0 n1 n2 n3 n5 n6 | Degree ♦ 36 6 8 46 8 | Indegree 18 5 1 20 4 0 | Search: | Graph Betweenness 3 507.29 1 7.40 7 7.88 5 993.34 4 11.81 2 0.00 | Close Close Close 0 6 9 9 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Vertices Edges Truncate text Show 10 • entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ | Print VosonCA_Type ∳ Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ | vosonTxt_metaKeywords Northwest Resistance Against Genetic Africa Agriculture Asia BIO Certifie | id n0 n1 n2 n3 n5 n6 n7 | Degree ♦ 36 6 8 46 8 46 8 0 0 | Indegree \$ 18 5 1 20 4 0 6 | Search: Outdegree 18 20 20 20 20 20 20 20 20 20 20 20 20 20 | Graph Betweenness 3 507.29 4 7.40 7 7.88 9 993.34 4 11.81 0 0.00 5 204.90 | Close 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Vertices Edges Truncate text Show 10 • entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.ifoam.org/ | Print vosonCA_Type Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.idoam.org/ | VosonTxt_metaKeywords | id (n0 n1 n2 n3 n5 n6 n7 n9 | Degree ♦ 366 66 8 466 8 00 111 6 | Indegree ♦ 18 5 1 20 4 0 6 2 | Search: Outdegree 18 20 20 20 20 20 20 20 20 20 20 20 20 20 | Graph Betweenness 507.29 7.40 7.7.88 5.993.34 4.11.81 0.000 5.204.90 4.7.99 | Close Close Close Close O |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.dsindia.com/www/default http://www.ota.com/index.html | Print vosonCA_Type Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nst.org.br/ http://www.organicconsumers.org/ http://www.organicconsumers.org/ http://uww.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 | Degree ∳ 36 6 8 46 8 0 11 11 6 | Indegree ∳ 18 5 1 20 4 0 6 2 1 4 1 4 1 1 1 1 1 1 1 1 1 1 1 1 1 | Search: Outdegree 18 20 20 20 20 20 20 20 20 20 20 20 20 20 | Graph Betweenness 3 507.29 4 7.40 7 7.88 3 993.34 4 11.81 9 0.00 5 204.90 4 7.99 3 139.45 | Close C |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html | Print vosonCA_Type ∳ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.oda.com/index.html http://www.ota.com/index.html | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 n10 | Degree ∳ 36 6 8 46 8 0 11 11 6 17 | Indegree ∲ 18 5 11 200 4 0 6 2 14 | Search: Outdegree 18 20 20 20 20 20 20 20 20 20 20 20 20 20 | Graph Betweenness 3 507.29 4 7.40 7 7.88 3 993.34 4 111.81 9 0.00 5 204.90 5 204.90 4 7.99 3 139.45 | Close C |
| Vertices Edges Truncate text Show 10 entries Copy CSV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi | Print vosonCA_Type ∳ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.idsindia.com/www/default http://www.oda.com/index.html http://www.ogmwatch.org/p1temp.asp? pi | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 n10 n11 | Degree ♦ 36 6 8 46 8 0 0 11 11 6 6 17 38 | Indegree 18 18 5 1 1 20 4 0 6 2 14 14 9 | Search: Outdegree 18 19 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 11 10 10 | Graph Betweenness 3 507.29 3 507.29 3 7.40 7 7.88 3 993.34 4 11.81 0 0.00 5 204.90 5 204.90 3 139.45 9 139.45 | Close C |
| Vertices Edges Image: Truncate text Show 10 • entries Copy CsV http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.organisconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.iddsindia.com/www/default http://www.ddsindia.com/www/default http://www.gmwatch.org/p1temp.asp? pi | Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nyrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ifoam.org/ http://www.idsindia.com/www/default http://www.ota.com/index.html http://www.gmwatch.org/pitemp.asp? pi | VosonTxt_metaKeywords | id (n0 n1 n2 n3 n5 n6 n7 n9 n10 n11 | Degree ♦ 36 8 46 8 0 11 11 6 17 38 | Indegree ♦ 18 5 1 1 20 4 4 0 6 6 6 2 2 14 4 9 | Search: [Outdegree] 12 12 12 12 12 12 12 12 12 12 12 12 12 | Graph Betweenness 3 507.29 4 7.40 7 7.88 5 993.34 4 11.81 0 0.00 5 204.90 4 7.99 3 139.45 4 420.37 | Close Colore Col |
| Vertices Edges Image: Truncate text Show 10 mentries Copy CSV http://www.denterforfoodsafety.org/ http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.organisconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.idsindia.com/www/default http://www.ifoam.org/pitemp.asp? pi X Showing 1 to 10 of 159 entries | Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://angelsagainstnanotech.blogspo http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ifoam.org/ http://www.ods.ndia.com/www/default http://www.ota.com/index.html http://www.gmwatch.org/pitemp.asp? pi | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 n10 Previous | Degree ∳ 36 6 8 46 8 0 11 11 6 17 38 us 1 | Indegree ♦ 18 5 1 1 20 4 4 0 6 6 6 2 2 14 4 9 | Search: [Outdegree] 20 20 20 20 20 20 20 20 20 20 20 20 20 | Graph Betweenness Betweenness Sor.29 Control Sor.20 Sor.2 | Close 0 6 6 9 9 9 9 0 0 7 6 6 4 4 0 0 • • • |
| Vertices Edges Image: Truncate text Show 10 rentries Copy CSV http://www.denterforfoodsafety.org/ http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.organisconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ddsindia.com/www/default http://www.ddsindia.com/www/default http://www.ddsindia.com/index.html http://www.gmwatch.org/p1temp.asp? pi Showing 1 to 10 of 159 entries Pruned Nodes | Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://angelsagainstnanotech.blogspo http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ifoam.org/ http://www.ota.com/index.html http://www.ota.com/index.html http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi Deselect All | VosonTxt_metaKeywords | id ∉ n0 n1 n2 n3 n5 n6 n7 n9 n10 n10 n10 n10 n10 n10 n10 n10 | Degree ∳ 36 6 8 46 8 0 11 6 17 38 00 11 | Indegree ∳ 18 5 1 20 4 4 0 6 6 2 14 9 2 2 3 | Search: Outdegree 12 22 24 24 25 | Graph Betweenness 3 3 5 5 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 | Close 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 |
| Vertices Edges Image: Truncate text Show 10 mentries Copy CSV Image: Show 10 mentries Copy CSV CSV <td>Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio</td> <td>name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi Deselect All Prune Selected</td> <td>VosonTxt_metaKeywords</td> <td>id n0 n1 n2 n3 n5 n6 n7 n9 n10 n11</td> <td>Degree ∳ 36 6 8 46 8 0 11 1 6 17 38 us 1</td> <td>Indegree ∳ 18 5 1 20 4 0 4 0 14 9 2 2 3</td> <td>Search: Outdegree 1 22 24 2 2 2 2 2 2 2</td> <td>Graph Betweenness 3 5 5 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1</td> <td>Close Close Colore Col</td> | Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.biodev.org/ http://angelsagainstnanotech.blogspo http://www.ifoam.org/ http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi Deselect All Prune Selected | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 n10 n11 | Degree ∳ 36 6 8 46 8 0 11 1 6 17 38 us 1 | Indegree ∳ 18 5 1 20 4 0 4 0 14 9 2 2 3 | Search: Outdegree 1 22 24 2 2 2 2 2 2 2 | Graph Betweenness 3 5 5 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 | Close Close Colore Col |
| Vertices Edges Image: Truncate text Show 10 mentries Copy Show 10 mentries Copy CSV http://www.denterforfoodsafety.org/ http://www.mst.org.br/ http://www.mst.org.br/ http://www.organicconsumers.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.idsindia.com/www/default http://www.ifoam.org/ http://www.ods.com/index.html http://www.ofa.com/joltemp.asp? pi Thus 10 of 159 entries Pruned Nodes http://ngin.tripod.com/ http://www.isi.org.uk/ http://www.isi.org.uk/ | Print VosonCA_Type ♦ Bio Bio Bio Bio Bio Bio Bio Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.biodev.org/ http://www.biodev.org/ http://www.ddsindia.com/www/default http://www.ddsindia.com/www/default http://www.ddsindia.com/www/default http://www.ota.com/index.html http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi Deselect All Prune Selected | VosonTxt_metaKeywords | id n0 n1 n2 n3 n5 n6 n7 n9 n11 | Degree ∳ 36 6 8 46 8 0 11 6 17 38 us 1 | Indegree ∳ 18 5 1 20 4 0 6 2 14 9 2 3 | Search: Outdegree = 18 22 24 2 2 2 2 2 2 2 | Graph Betweenness 3 5 5 9 9 1 1 1 1 1 1 1 1 1 1 1 1 1 | Close Close Colore Colo |
| Vertices Edges Image: Truncate text Show 10 • entries Copy CSV Image: Truncate text Copy CSV CSV Image: Truncate | Print VosonCA_Type Bio | name http://www.centerforfoodsafety.org/ http://www.mst.org.br/ http://www.nwrage.org/ http://www.organicconsumers.org/ http://www.organicconsumers.org/ http://www.ofoam.org/ http://www.ifoam.org/ http://www.ifoam.org/ http://www.ddsindia.com/www/default http://www.ota.com/index.html http://www.ota.com/index.html http://www.gmwatch.org/p1temp.asp? pi | VosonTxt_metaKeywords Northwest Resistance Against Genetic Africa Agriculture Asia BIO Certifie Andhra Andhra Pradesh Deccan Designe GM Watch GMWatch.org Genetically Mod | id n0 n1 n2 n3 n5 n6 n7 n9 n10 n10 n11 vertical display="block"/> | Degree ♦ 36 6 8 46 8 0 11 1 6 17 38 us 1 | Indegree ♦ 18 5 1 20 4 4 0 6 2 14 9 2 3 | Search: Outdegree 1 2 2 2 2 2 2 2 2 2 | Graph Betweenness 3 5 5 9 9 9 9 9 9 9 9 9 9 9 9 9 | Close Close Colore Colo |

Figure 7: Manipulating network database

The canvas on the right side contains visualizations of text analysis. There are two sliders, "Display Top" is used to control how many words will appear in the visualisations (only the top x words, based on frequency counts, will be shown), and "Minimum Frequency" controls how many times a word needs to have been used in order for it to feature in the visualizations.

There are three types of text analysis visualization:

| Filters Image: Remove standard stopwords User-defined stopwords |
|---|
| Remove user-defined stopwords Remove Twitter hashtags Remove Twitter usernames Apply word stemming |

Figure 8: Text filters

- "Word Frequency": contains frequency bar chart(s), and if applicable a bar chart for each category will be displayed (Figure 9).
- "Word Cloud": the size of a word to represents its frequency. For network with subgroups, word clouds for each category will also be displayed (Figure 10).
- "Comparison Cloud": when the network contains subgroups, this will show the words that most identified with or associated with each group. (Figure 11).

It is possible to save the text analysis visualizations by right-clicking "Save Image" and inputting the file name and file type.



Figure 9: Word frequency bar chart



Figure 10: Word cloud



Figure 11: Comparison cloud

5 Collecting data with VOSON Dashboard

5.1 API Keys

To collect data from Twitter and YouTube, you first need to obtain API keys for Twitter and YouTube. Some instructions are provided here, but please note that the social media companies change APIs and so these instructions may be out of date.

5.1.1 Loading API keys

While it is possible to paste API keys directly in the "Twitter" or "YouTube" collection windows (Figure 12), a better approach is to use the "API Keys" window (Figure 13): here you can paste your keys and then click "Save Keys" to save your API keys to disk (to a file named "voson_keys.rds"). You will then be able to access your keys in a later session using the "Load Keys" button. If you use a public accessible computer, please make sure to delete your "voson_keys.rds" file.

| 🍪 Home | ADI Kov | 🚯 Home | | ata ADI Key |
|----------------------------|---------------------|--------------------------|---------------|------------------|
| < Network Graphs | | - Netwo | ork Graphs | |
| Lul Network Metrics | API Secret | <u>lılıl</u> Networ | ork Metrics A | dd Video ID |
| և <u>ա</u> l Text Analysis | Access Token | <mark>ևևև</mark> Text Ar | nalysis | 6 d d |
| 🔟 Assortativity | | Lill Assorta | ativity | Add |
| 🎔 Twitter | Access Token Secret | 🎔 Twitter | r | * |
| Youtube | | 🔠 Youtub | be | |
| ဒု. API Keys | Search Term | م API Key | iys | Remove |
| | • | | | Collect Comments |
| | ✓ Retweets | | | |

Figure 12: Input API keys directly in "Twitter" or "YouTube" menu

| ℬ Home Setwork Graphs | Social Media API Keys | 🎔 Twitter АРІ Кеу | 👼 Youtube Data API Key |
|--|-----------------------|----------------------|---------------------------|
| Lul Network Metrics | Save neys Load neys | API Secret | Bulles Verre |
| Luul Text Analysis | | | rti ose veiz |
| 🖌 Twitter | | Access Token | |
| 🚋 Youtube | | Access Token Secret | |
| 🍳 API Keys | | 쉽 Use Keys | |

Figure 13: Input, save and load API keys in "API Keys" window

5.2 Collecting data from Twitter

5.2.1 Search Terms

Both hashtags and account names can be used as search criteria for Twitter.

- When using hashtags as key words, leave the drop-down menu under the key words box empty.
- When using accounts as keywords, the drop-down menu can be left empty, or choose either of "From" or "To". Leaving the menu empty will crawl tweets and re-tweets from and to the ac-

count(s). Selecting "From" will only crawl the tweets and re-tweet initiative from the account(s), and selecting "To" will only crawl tweets and re-tweets to the account(s).

If more than one search terms are defined, tweets and re-tweets contain either of the terms will be collected.

By clicking or un-clicking the boxes in front of "Re-tweets" and "Replies", the type of Twitter activities to be collected can be defined.

The "Count" bar is design to control the number of collected tweets.

The "Language" bar is design to select the language of tweets to be collected.

The "Date Range" provides a option to collect tweets during a certain time period. *Please note that the Twitter Free API only allows collection of tweets authored over the previous 7 days.*

5.2.2 Navigating the database

A table of the collected data is shown at the bottom. Basic attributes of each tweets are listed in this table, including: text, favorite and favorite count, IDs of tweets and re-tweets, time and etc.

There is a "Truncate text" option on the left top of the data table. If click the "Truncate text", a column containing truncated text will be generated.

At the top right of the table, there is a Search box: by entering text, only the matched records will be shown.

5.2.3 Saving the database

The collected data can be download by right-clicking the buttons below the "Console":

- "Download Data": Click this to save a database in csv format.
- "Download Graphml": Click this to save a database in graphml format.
- "Download Graphml (+ text)": Click this to save a graphml file that also includes the text content.

5.2.4 Working with the Twitter database

There are two ways to work with the Twitter data just collected: Click "View Graph" to visualize the network, or save the database as a graphml file and then load it from the "Network Graphs" window.

5.3 Collecting data from YouTube

5.3.1 Search term

YouTube comments can be collected by using the video ID, which is the part after "=" in the YouTube URL. For example, the ID of the video "https://www.youtube.com/watch?v=l94v4YOqxOc" is "l94v4YOqxOcs" (Figure 14). When more than one video IDs are applied to search, the comments of each video will be crawled.



Figure 14: YouTube Video ID

5.3.2 Navigating the database

The table of collected YouTube data is listed at the bottom of the "Console". The main attributes of collected comments are listed in this table, including the user who post the comment, the text content of comment, reply to other users and etc.

By clicking the "Truncate text" on the top left of the table, a column of truncated comments will be generated.

Similar to Twitter data, there is a Search box on the top right of the table. You can enter any text and matched records will be shown.

| Res | ults | | | | | | | You | utube Data | | |
|------------|--|-----------------|-----------------|-----------------|------------------------------|---|--------------------------------|----------------------|-------------|--|--|
| ▼ T Sho | Truncate text Show 10 | | | | | | | | | | |
| | Comment 🛛 🔶 | User 🔶 | ReplyCount 🔶 | LikeCount 🔶 | PublishTime 🕴 | CommentId $	riangleta$ | ParentID 🔶 | ReplyToAnotherUser 🗍 | VideoID 🔶 | | |
| 110 | "Mr. Speaker, we can never compromis | Clay Pidgeon | 0 | 0 | 2018-09- 22T04:07:22.000Z | UgzTUb2ortyZfezxrCd4AaABAg | None | FALSE | XziLNeFm1ok | | |
| 49 | "Mr. Speaker we can never compromise | VM 9 | 1 | 3 | 2018-08- 29T14:32:17.000Z | UgyCtTV2zvEHWYy8zQ54AaABAg | None | FALSE | XziLNeFm1ok | | |
| 71 | 1:13:41 1:15:52 1:16:15 1:37:33 | Marlon James | 0 | 4 | 2018-08- 22T14:36:53.000Z | UgzQvufbiWgP1aDREJF4AaABAg | None | FALSE | XziLNeFm1ok | | |
| 210 | THE SPEAKER THE CONDUCT | caav56 | 0 | 0 | 2018-09- 17T15:55:57.000Z | UgyM3- NwbnkijshGRnp4AaABAg.8lBsHAYYzUS8lloy4HaXNt | UgyM3- NwbnkljshGRnp4AaABAg | YoshGamin | XziLNeFm1ok | | |
| Sho | wing 1 to 4 of 4 entr | ies (filtere | d from 220 tota | l entries) | | | | Previous | 1 Next | | |

Figure 15: Searching in YouTube data

5.3.3 Saving database

The collected YouTube database can be saved in two ways:

- By right-clicking "Download Data" and entering name and type (csv) of the file, a csv file is saved.
- By right-clicking "Download Graphml" and entering name and type (graphml) of the file, a graphml file is saved.

5.3.4 Working with collected YouTube data

As with Twitter, you can quickly view the visualization of collected YouTube data by clicking "View Graph". Alternatively, you can save the graphml file and then load into the "Network Graphs" window.