

N V I Z I O N

## USER GUIDE

# Contents

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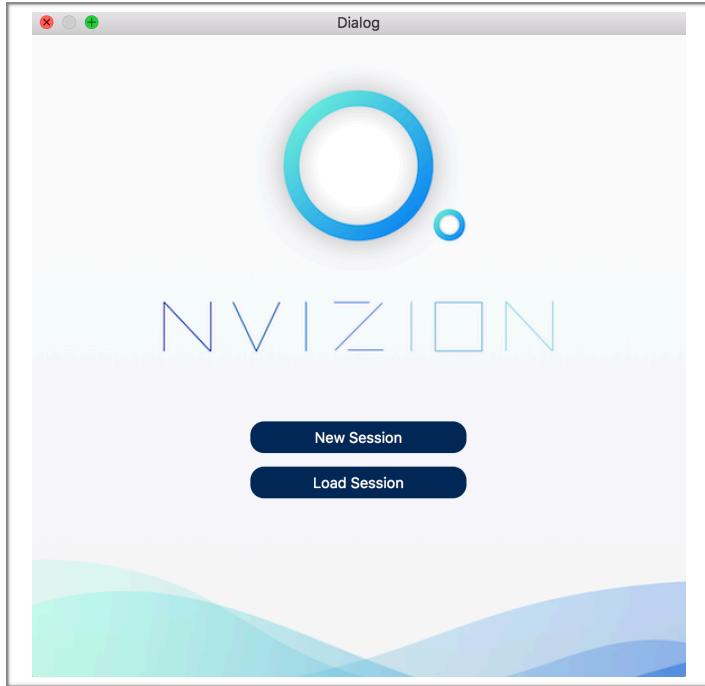
7 — User Guide	1
7.1 — Starting Screen	1
7.2 — New Session: The Dashboard	1
7.3 — Load Files	2
7.4 — Filters & Sorts	4
7.5 — Visualizations	5
7.6 — PDF Export / Print	6
7.7 — Session Saving	7
8 — Collaboration View (Continuation of User Guide)	8
8.1 — Definition	8
8.2 — Possible User Actions within View	9
8.3 — Additional Possible Actions within View	10
8.4 — Warning about Large File Computation	10
8.5 — Demo of Large File Visualization	10
9 — On-The-Fly Filters (User-Selected Lists Filtering)	12

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## 7 — User Guide

### 7.1 — Starting Screen

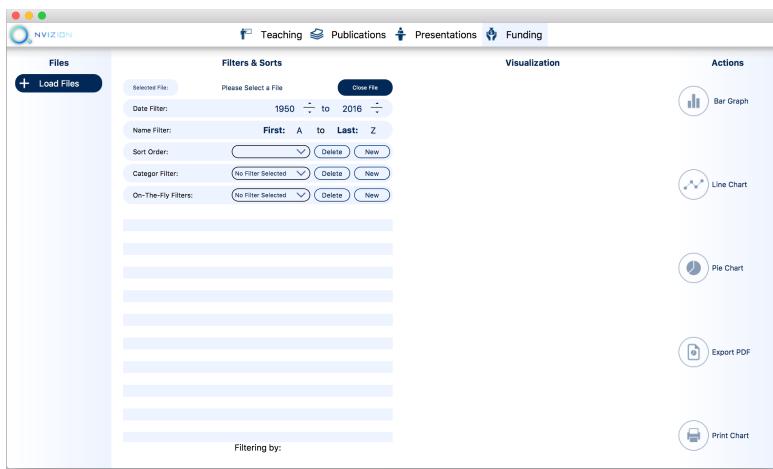
#### Starting Screen



This is what the Starting Screen looks like. Here you'll be able to select a new session, or select load session to continue working on a previous saved section. Clicking Load Session opens a File Browser in which case you can select a previously saved file which ends in **.dat format**.

**CMD/CTRL + N → New Session**  
**CMD/CTRL + L → Load Session**

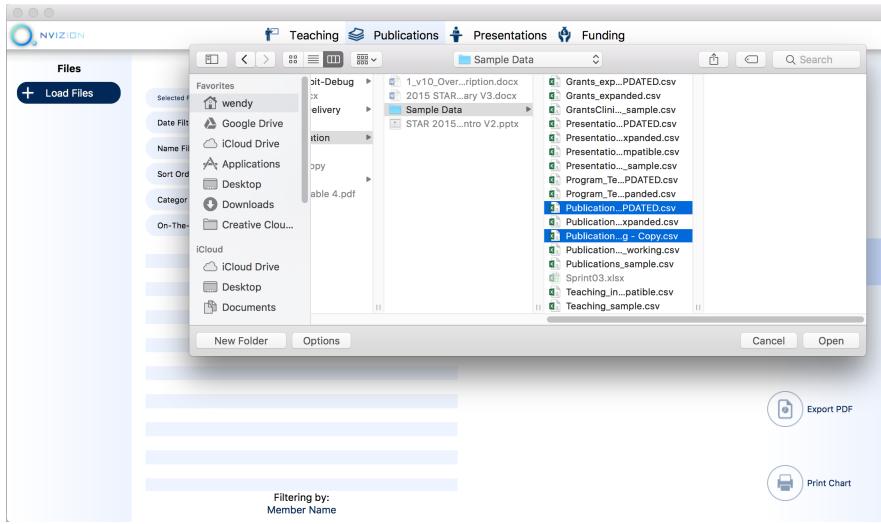
### 7.2 — New Session: The Dashboard



This is the New Session screen, where you'll see 4 tabs at the top indicating which type of file you're working with (Teaching, Publications, Presentations, Funding). You can Load Files (6.3 Load Files), select Filters & Sorts (6.4 Filters & Sorts), visualize your data (6.5 Visualize), as well as additional actions to change the data visualization (6.6 Actions).

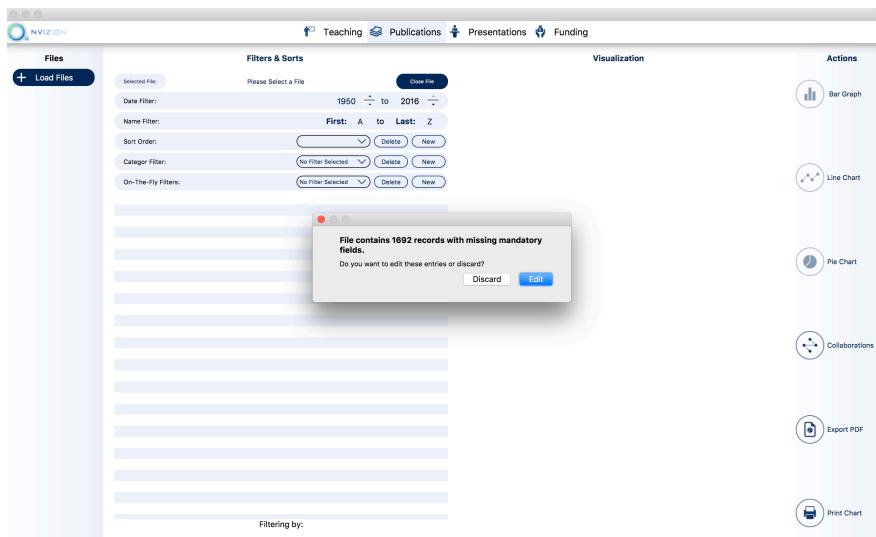
**CMD/CTRL + L → Load Files**

## 7.3 – Load Files



### **Publication: Load File**

Clicking the **+** **Load Files** button will bring up your file explorer, where you can choose which files to load. You are now able to select multiple files of any type you wish and click “Open”. All files will be opened and placed under each appropriate tab for you and listed in the left **“Files Sidebar”** for you to click on to view in the Dashboard.



### **Publication: Load File Errors**

Occasionally, there may be missing fields in the CSV files that are being opened, in which case you can choose to edit the files, or discard rows with missing data and continue.

ID	Member Name	Department	Division	Publication Status	Pubmed Article ID	Type	Area	Status Date	Role	Peer Reviewed?	Published In I	Presentation?	Significant Publ
1	23084	Mooe, Dav...	Medicine	Allergy	Published	* Articles in ...			Principal Aut...	FALSE	FALSE	FALSE	FALSE
2	23097	Mooe, Dav...	Medicine	Allergy	Published	Published A...	Research		Principal Aut...	FALSE	FALSE	FALSE	FALSE
3	23115	Mooe, Dav...	Medicine	Allergy	Submitted	Published A...	Research		Collaborator	FALSE	TRUE	FALSE	
4	23116	Mooe, Dav...	Medicine	Allergy	Published	Published A...	Research		Collaborator	FALSE	TRUE	TRUE	FALSE
5	23118	Mooe, Dav...	Medicine	Allergy	Published	Published A...	Research		Collaborator	FALSE	FALSE	FALSE	FALSE
6	10108	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Nov-77	TRUE	TRUE	TRUE	FALSE	
7	10109	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Nov-77	TRUE	TRUE	TRUE	FALSE	
8	10110	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1977	TRUE	TRUE	TRUE	FALSE	
9	10111	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1978	TRUE	TRUE	TRUE	FALSE	
10	10113	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Mar-78	TRUE	TRUE	TRUE	FALSE	
11	10114	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1978	TRUE	TRUE	TRUE	FALSE	
12	10115	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1978	TRUE	TRUE	TRUE	FALSE	
13	10116	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1978	TRUE	TRUE	TRUE	FALSE	
14	10118	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Oct-78	TRUE	TRUE	TRUE	FALSE	
15	10120	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Oct-78	TRUE	TRUE	TRUE	FALSE	
16	10121	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1978	TRUE	TRUE	TRUE	FALSE	
17	10122	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1979	TRUE	TRUE	TRUE	FALSE	
18	10123	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1979	TRUE	TRUE	TRUE	FALSE	
19	10125	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Feb-79	TRUE	TRUE	TRUE	FALSE	
20	10126	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Feb-79	TRUE	TRUE	TRUE	FALSE	
21	10129	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Jun-79	TRUE	TRUE	TRUE	FALSE	
22	10131	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Oct-79	TRUE	TRUE	TRUE	FALSE	
23	10132	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Jun-80	TRUE	TRUE	TRUE	FALSE	
24	10133	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	Jun-80	TRUE	TRUE	TRUE	FALSE	
25	10134	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1980	TRUE	TRUE	TRUE	FALSE	
26	10135	Kostuk, Will...	Medicine	Cardiology	Published	Published A...	Research	1980-02-25	TRUE	TRUE	TRUE	FALSE	

Previous File Next File

File Contains 1651 Errors

Cancel Save

## Publications: Edit Load Files

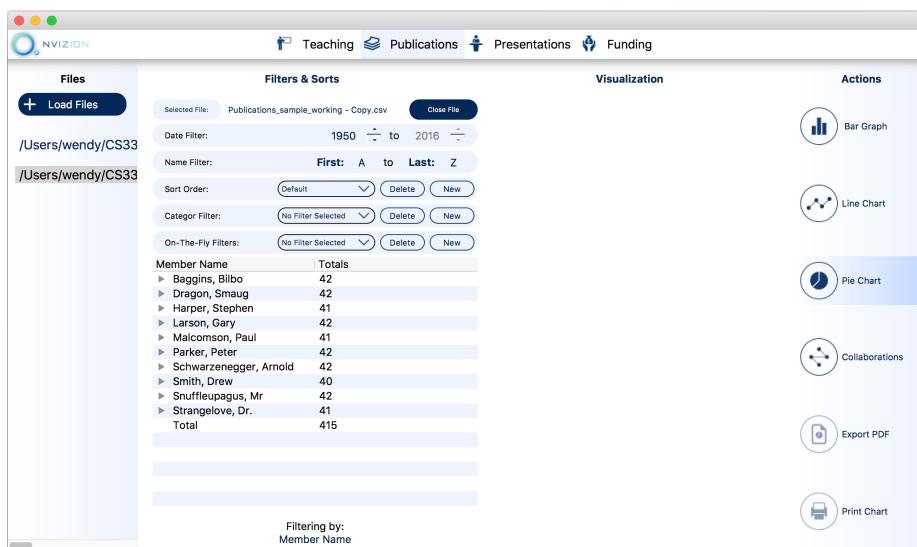
If you clicked “Edit”, you will see this full screen error-editing view, where the missing fields are highlighted in pink. You can navigate through the errors and files, as well as cancel or save. Current file being viewed is displayed at the top of the window along with its file path.

**ESC → Cancel**

**CMD/CTR + S → Save**

## Example: Loading Two Publication Files

After loading the two files, you can choose which one to work with. After selecting the second file in the Files column, you can see the data populated under the Filters & Sorts. The Filename and Filepath is displayed above the Filters & Sorts in between the **Close File button** and “Selected File” label. Close File button unloads the dashboard’s table and removes the file from the current session.



## 7.4 – Filters & Sorts

There are various filters that you can work with, ranging from name filter, date filter, sort order, and more. The following are some examples of the Name and Sort filters.

Member Name	Totals
Dragon, Smaug	42
Hansen, Stephen	41
Larson, Gary	42
Malcomson, Paul	41
Parker, Peter	42
Schwarzenegger, Arnold	42
Smith, Drew	40
Snuffleupagus, Mr	42
Strangelove, Dr.	41
Total	373

### Filter & Sort: Name Filter

By typing C into “First.” in the Name Filter, you can filter all the members by last name from C to Z.

### Filter & Sort: Save Sort Order

To save a sort order, you can click New under Sort Order. Here, we've named the new sort order "SortCtoZ", and sorted by Member Name and Role.

The screenshot shows the NVIZION software interface. On the left, there's a sidebar with 'Files' and a 'Load Files' button. The main area has tabs for 'Teaching', 'Publications', 'Presentations', and 'Funding'. Below these are 'Filters & Sorts' and 'Visualization' sections. The 'Filters & Sorts' section includes a date filter from 1950 to 2016, a name filter from A to Z, and sort orders like 'Default', 'YzSort', 'SortCsz', and 'SortCsz'. The 'Visualization' section on the right lists 'Bar Graph', 'Line Chart', 'Pie Chart', 'Collaborations', 'Export PDF', and 'Print Chart'. The main content area displays a list of member names with their totals:

Member Name	Totals
Aabel, Angra (Test Reco...	2
Adams, Paul	302
Aguanno, Alaina	3
Al-Judaiji, Bandar	37
Althenayan, Eyad	12
Anderson, Scott	13
Arbeau, Ryan	1
Armfield, Robert	13
Astfah, Samuel	29
Bagur, Rodrigo	55
Ball, Ian	14
Barnett, William	9
Barra, Lillian	28
Basharat, Peri	13
Beaton, Melanie	12
Bergin, Lynn	6
Bhimani, Mansif	6
Blake, Peter	279

Filtering by: Member Name

## Filter & Sort: See Saved Sort Orders

If you select the Sort Order again, you can see the previously saved sort orders and apply selected sorts.

## 7.5 –Visualizations

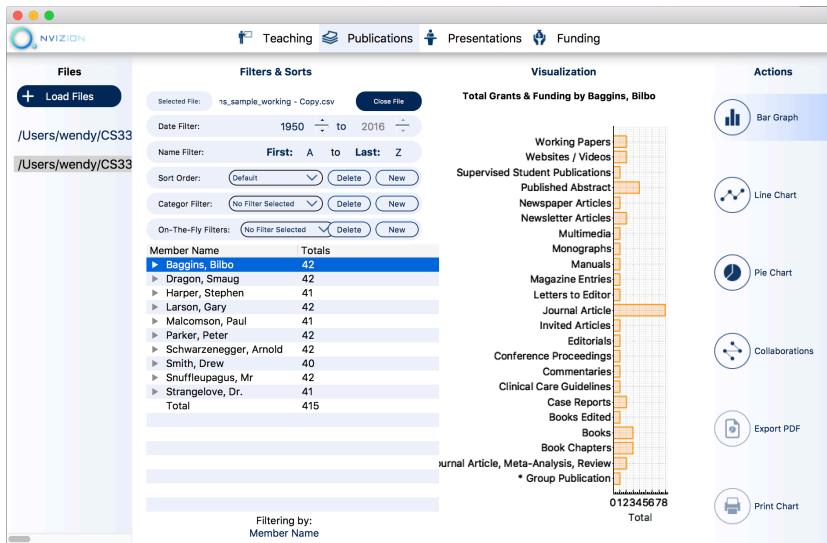
The screenshot shows the NVIZION software interface. The main content area displays a pie chart titled 'Total Grants & Funding by Baggins, Bilbo'. Below the pie chart is a legend with categories: Group Public..., Journal Article..., Book Chapters, Books, Books Edited, Case Reports, Clinical Care G... The legend items are color-coded: teal, blue, yellow, green, light green, dark brown, and brown. The main content area also shows a list of member names with their totals, where 'Baggins, Bilbo' is highlighted in blue:

Member Name	Totals
Baggins, Bilbo	42
Dragon, Smaug	42
Harper, Stephen	41
Larson, Gary	42
Malcomson, Paul	41
Parker, Peter	42
Schwarzenegger, Arnold	42
Smith, Drew	40
Snuffleupagus, Mr	42
Strangelove, Dr.	41
Total	415

Filtering by: Member Name

## Visualization: Pie Chart

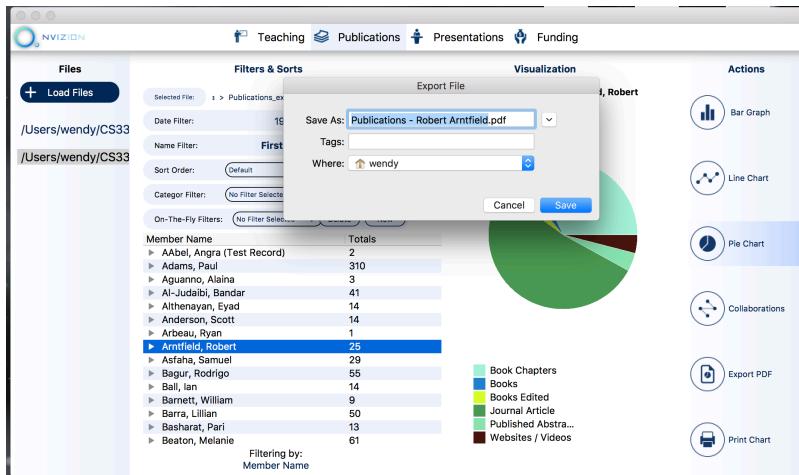
By clicking Pie Chart while selecting a member name, we can see the details for that member. The legend below the pie chart becomes scrollable when it is too large to display in the window as shown.



## Visualization: Bar Graph & Line Chart

We can also choose other charts like Bar Graphs and Line Chart.

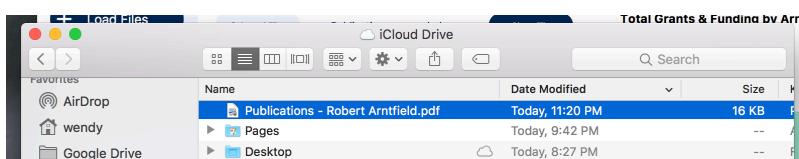
## 7.6 – Export PDF / Print



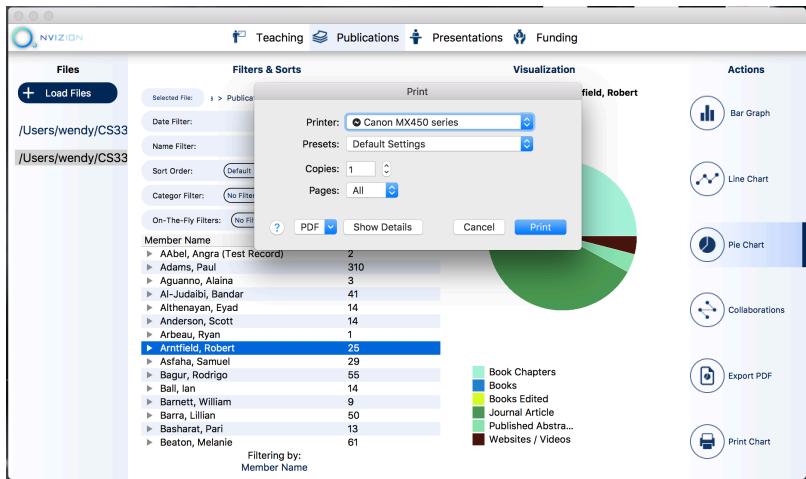
### Export as PDF

On clicking the “Export PDF” button, you will be able to save the visualization you are currently looking at as a PDF file on your computer. To change the size of the figures in the PDF, first resize the main dashboard window itself before exporting to PDF. This resize translates into a resize of the figures on the exported PDF.

**CMD/CTR + E → Export to PDF**



Exported PDF



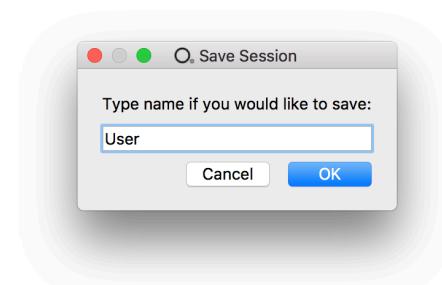
### Print Visualization

On clicking "Print Chart", you can also select a printer to print the visualization to.

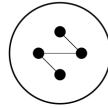
**CMD/CTR + P → Print**

## 7.7 – Session Saving

To save a session, simply attempt to close the window by clicking the "x" button in your respective OS-dependent close button. You will be prompted to save the session or discard your work upon button press.



*Collaboration View user guide follows on the next page.*



# Collaboration View

User clicks on Collaboration View ( ) in Publications Tab

## 8.1 — Definition

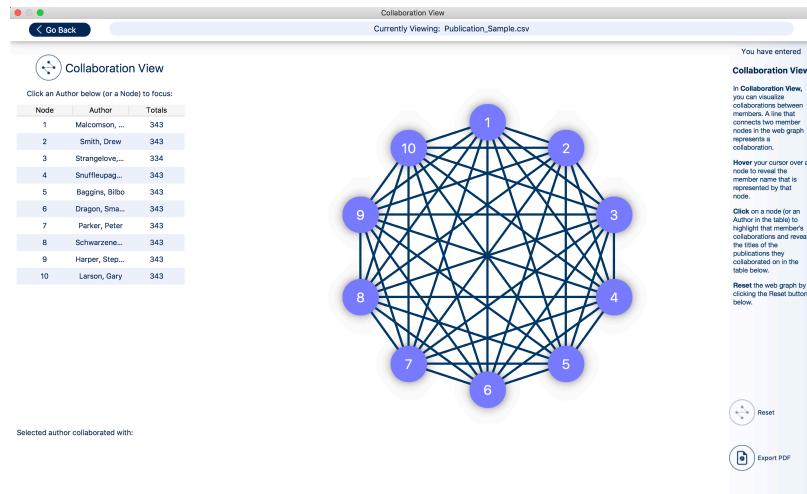
In Collaboration View, you can visualize collaborations between members in a Publication CSV file. Here, we demonstrate this feature by loading 2 files: 1) Publication\_Sample.csv and 2) Publication\_Expanded\_UPDATED

Member Name	Totals
▶ Baggins, Bilbo	42
▶ Dragon, Smaug	42
▶ Harper, Stephen	41
▶ Larson, Gary	42
▶ Malcomson, Paul	41
▶ Parker, Peter	42
▶ Schwarzenegger, Arnold	42
▶ Smith, Drew	40
▶ Snuffleupagus, Mr.	42
▶ Strangelove, Dr.	41
Total	415

Here, we've loaded Publication\_Sample.CSV. We have navigated to the Publications Tab. Note the "Collaborations" button located in the right "Actions Side-bar" which is unique only to the Publications Tab.

*Click the "Collaborations" button.*

A new maximized window pop ups with a web graph visualization as shown below:



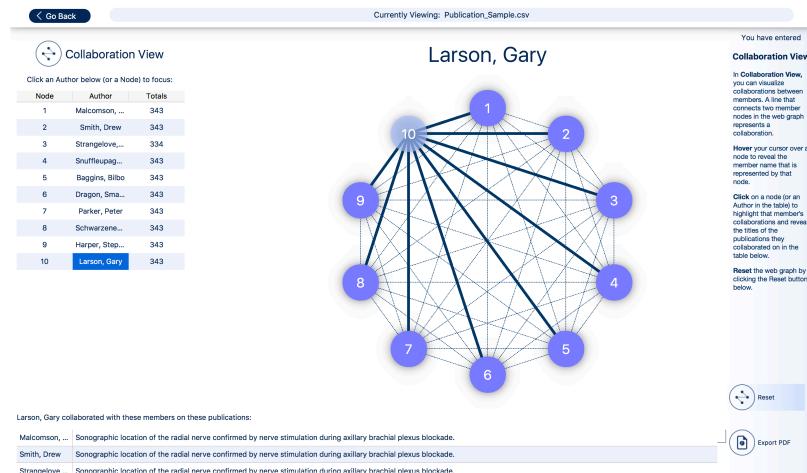
Each node in the web graph represents an author (ie. a member) and a line between two nodes represents a collaboration between those two members. **The main criteria we used to determine if a collaboration has occurred is:** if the title of a publication is the same between two or more members, then it was assumed those two or more members collaborated with one another.

## 8.2 — Possible User Actions within View

You can simply click on a name in the table on the left (or the node number in the Node column) and NVIZION will automatically:

- ▶ highlight the corresponding node (focus on selected Author's node)
- ▶ bolden only its connecting lines (focus on selected Author's collaboration lines)
- ▶ fade away all other connecting lines
- ▶ Set the title of the Collaboration View's web graph to the selected Author's name.
- ▶ Reveal the name of all authors the selected author has collaborated with along with the title of all publications they have collaborated on, in the table positioned at the bottom below the web graph "Selected Author Collaborated With: "

The following screenshot shows the above in action where Larson Gary was selected:



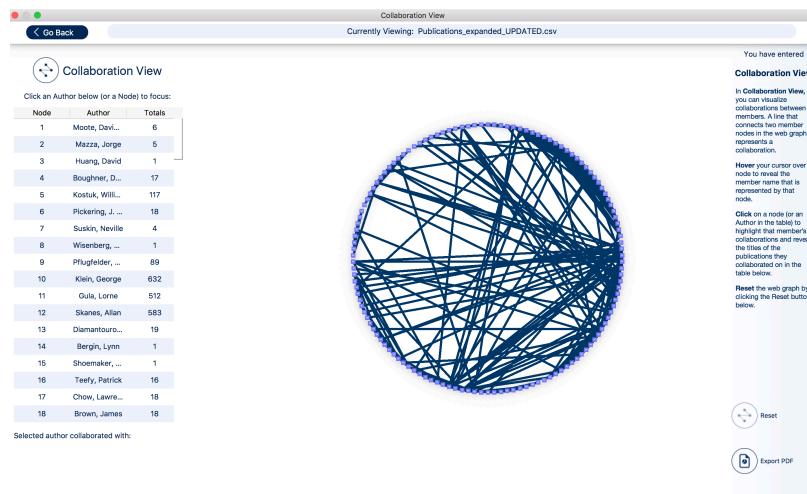
### 8.3 — Additional actions the user is able to take in Collaboration View:

- ▶ You can click the actual nodes themselves to focus on one node and its connecting lines
- ▶ You can hover your cursor over each node to reveal the name of the author each node represents.
- ▶ You can click the “Reset” button in the right “Actions Bar” to “unselect” a node and reset the node and line focus (reset the web graph).
- ▶ In the table on the left, you can sort each columns by clicking each header. The Node and Totals column will be sorted from smallest to largest and Author will be sorted alphabetically.
- ▶ You can export two things from this view: the web graph with its title (if a node / author has been selected) and the left legend table which will be rendered on the second page in the PDF document.
  - ▶ Note: the render of the web graph \*might\* be very small in the PDF file that is exported — but because PDF is a vector-based format, you can zoom in as much as you want into where the web graph has been placed on the page while retaining perfect render quality of the web graph. In hindsight, a fully-fledged PDF Exporting open-source C++ library should have been used but because the customer did not specify that they needed the PDF exporting functionality to be improved upon, we re-used the previous team's (Team Peach's) manual PDF exporting functionality.

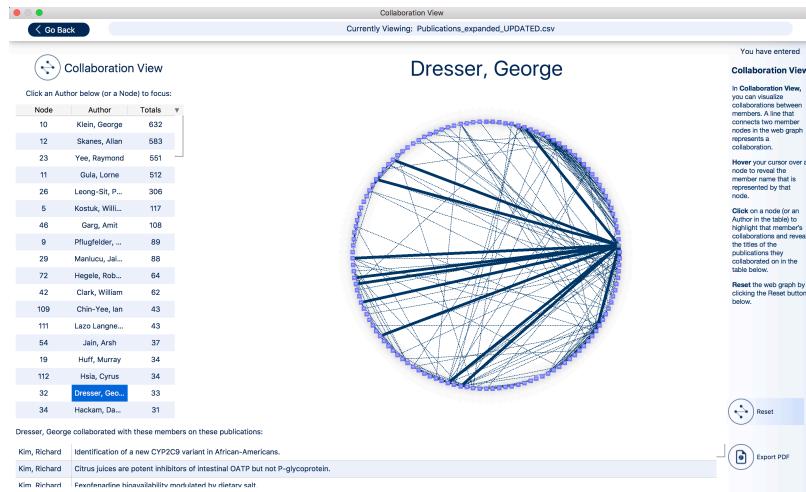
## 8.4 — Warning

When loading very large files, the computations required to determine collaborations can take awhile. On a Core i7 with 16 GB RAM, a solid-state drive running MacOS Sierra, it took us ~2 minutes to render the web graph for **“Publications\_expanded\_UPDATED.csv”**. However, once a large file has been loaded and computed once, it **does not** need to re-compute the collaborations every time the Collaborations button is pressed. Performance may vary on different machines and different file sizes. The “sample” files loaded instantly in our tests.

### 8.5 — Demo of Large File Visualization: A screenshot of Publications\_expanded\_UPDATED.csv being loaded and rendered:



The following below has “Dresser, George” selected. Note the **“Totals” column** has been sorted to find out who has collaborated the most.



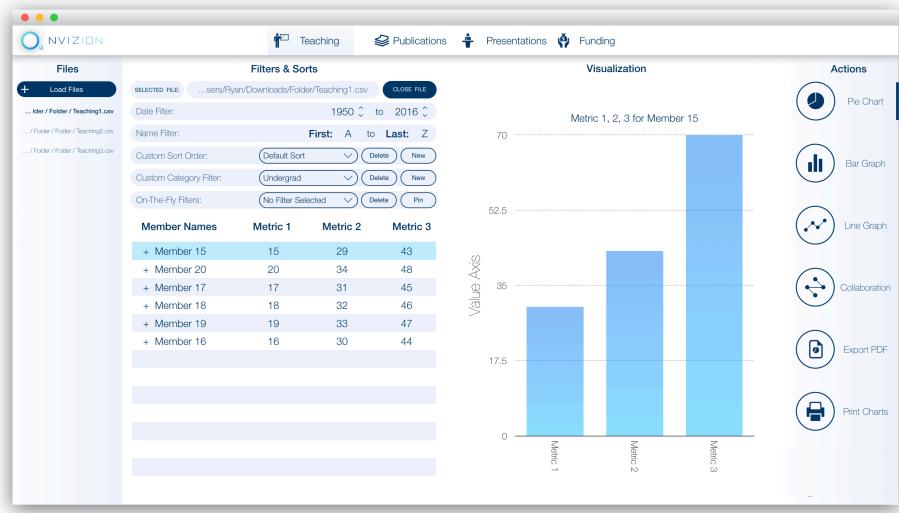
Note that tips and instructions on what a user can do in the Collaboration View will always be present in the right Actions Side-Bar.

Explanations of the algorithms that generate this visualization, ( which were created from scratch ), are given in the Appendix.

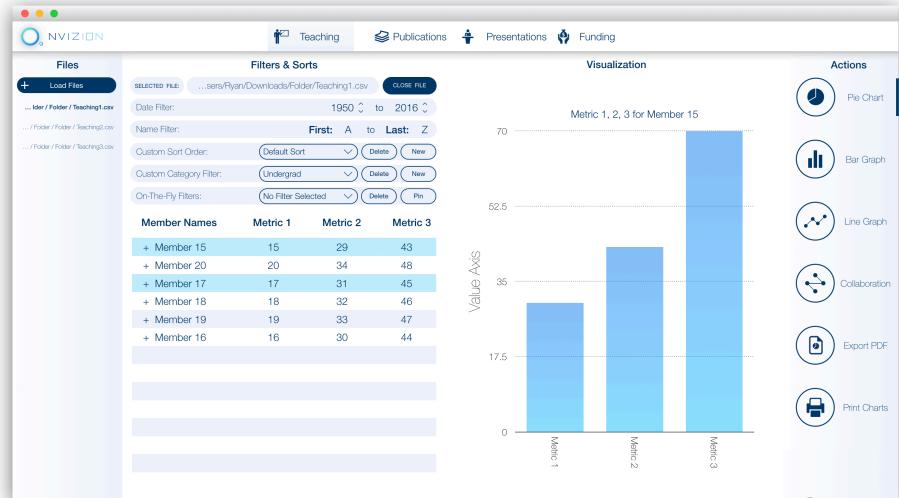
*On-The-Fly Filters (User-Selected Lists Filtering) Feature is walked-through on the next set of pages.*

**User Selected List Filtering  
(On The Fly Filters)**

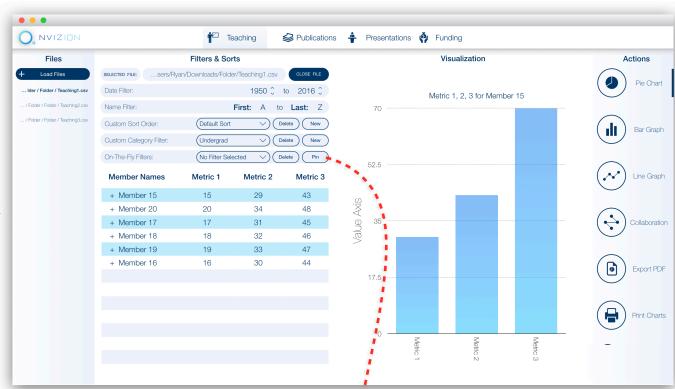
Only members that have taught undergrad now show up:  
(note that we have a default sort order here)



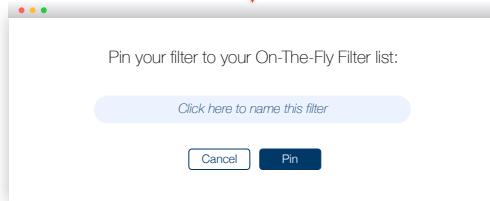
User has selected 2 rows by holding down Ctrl/Cmd + left click



User has selected 3 rows by holding down Ctrl/Cmd + left click



User can pin this "On the fly" filter to their saved filtered lists so they may instantly re-apply this user-created filter at another time.



Pinned filter is applied and only filtered items are now visible. Only these items will be inputted into the graph.

