Gephi Tutorial Visualization

Welcome to this Gephi tutorial. It will guide you to the basic and advanced visualization settings in Gephi. The selection and interaction with tools will also be introduced. Follow the Quick Start tutorial to learn the basic steps.

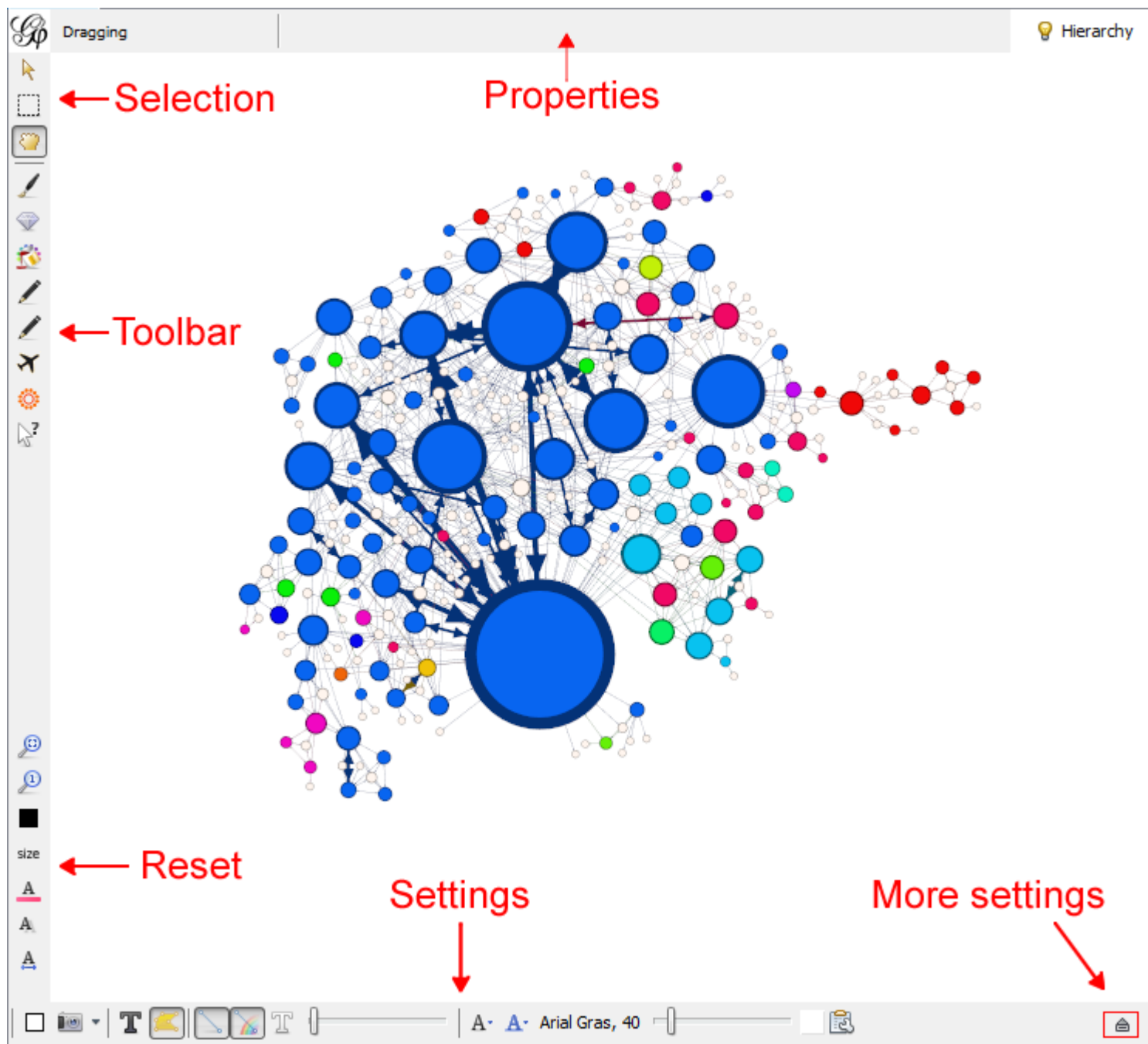Gephi version 0.7alpha4 is used to do this tutorial.

⬇ **Get Gephi**

A sample airlines.gexf dataset is used during this tutorial. It maps airline routes in the United-States.

Last updated May 26th, 2010

Introduction

Gephi is built around its visualization window, which looks like below. Each element has a function and will be detailed in this tutorial.

Zoom & Pan

- Use your mouse to move and scale the visualization
    - Zoom: Mouse Wheel
    - Pan: Right Mouse Drag

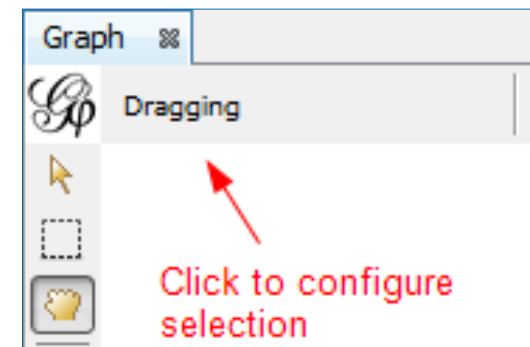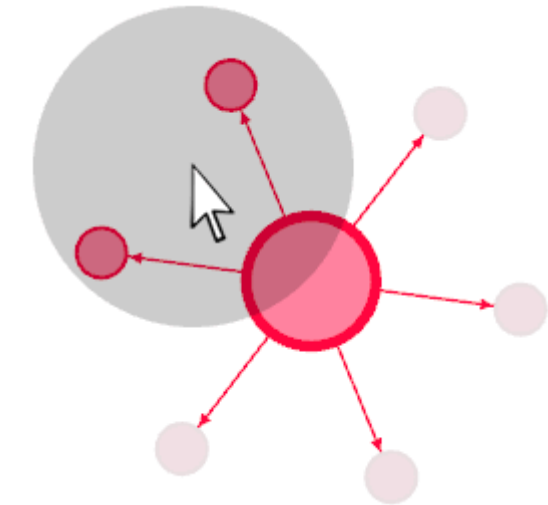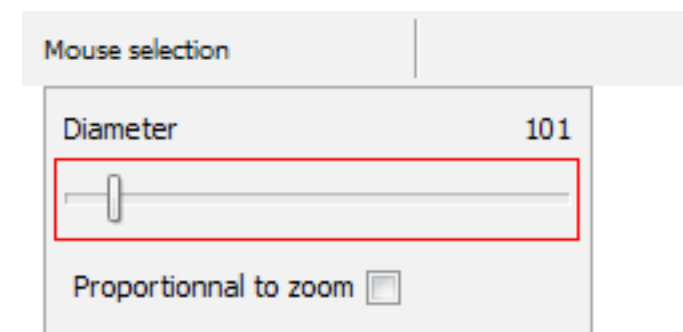- If you loose your graph, reset the zoom
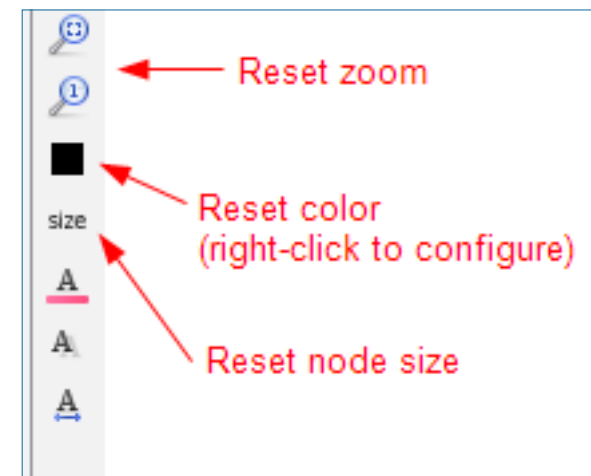
Zoom

Pan

Selection size

When you start Gephi, the drag mode 🖐 is enabled and let you drag nodes by keeping left mouse pressed and moving away.

The dragging selection size can be changed:

• Click on the area where "Dragging" is written

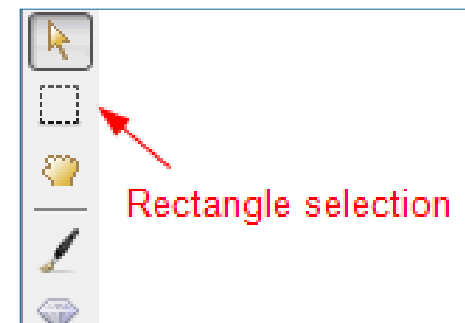• Configure the "Diameter" with the slider

Rectangle selection

The rectangle selection is used to select one or multiple area of the network.

• Select the "Rectangle" selection tool

Rectangle selection

• Press the left mouse on the visualization window and expand the rectangle zone by keeping left button pressed

• To reset selection, click somewhere else on the window
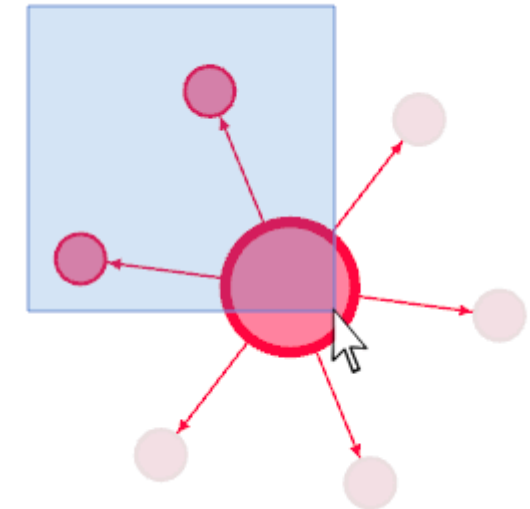
One can also select single nodes by clicking on them and keeping CTRL key (Command on Macintosh).
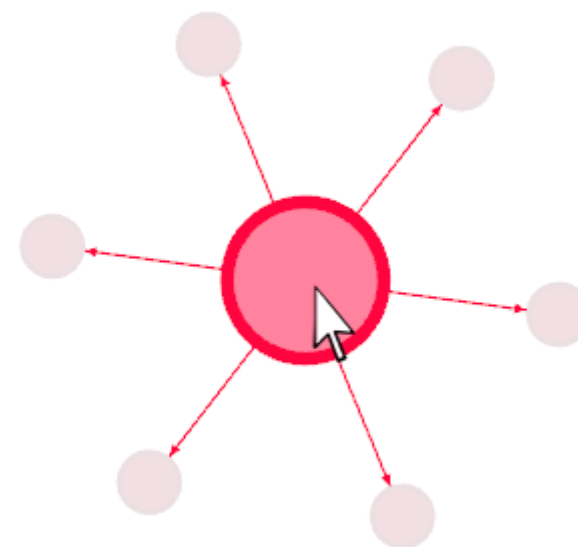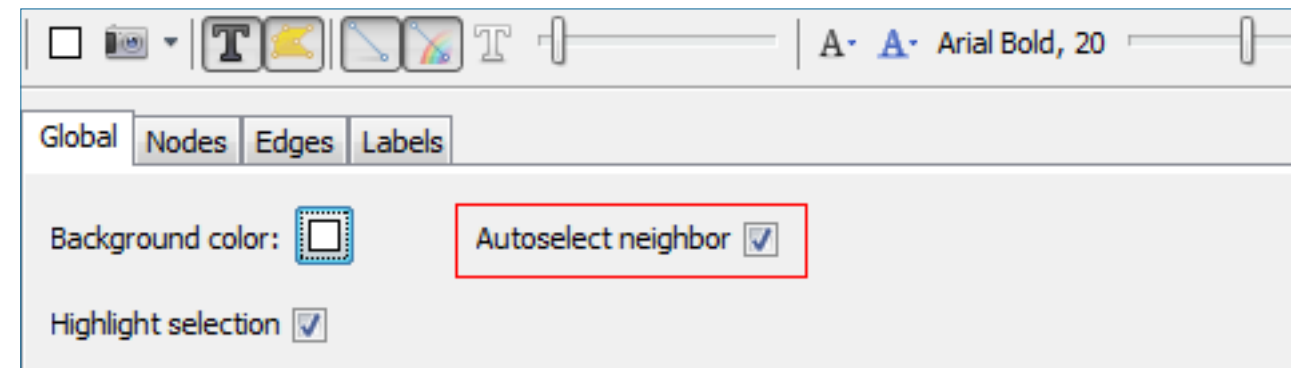
Autoselect neighbors

Essential option to enhance readability of the network. Selected nodes neighbors are automatically selected as well, allowing to know who is connected to who easily.
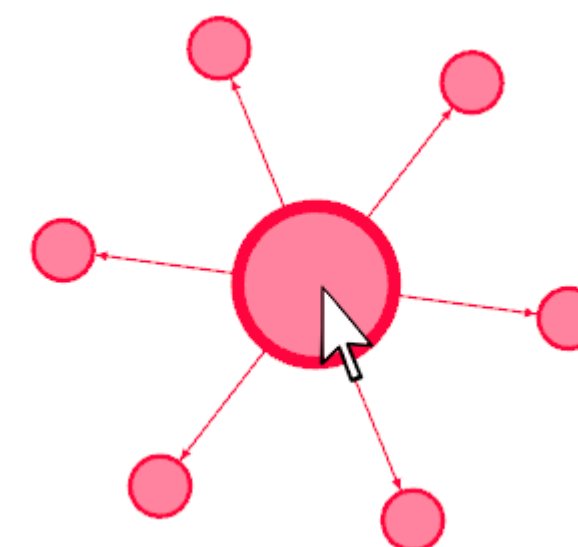
- Expand 🔺 the visualization settings

Expand settings
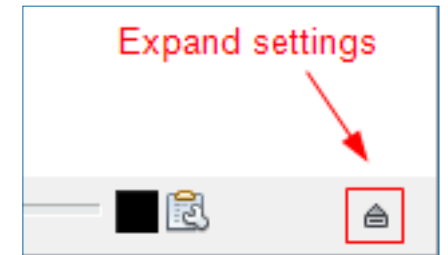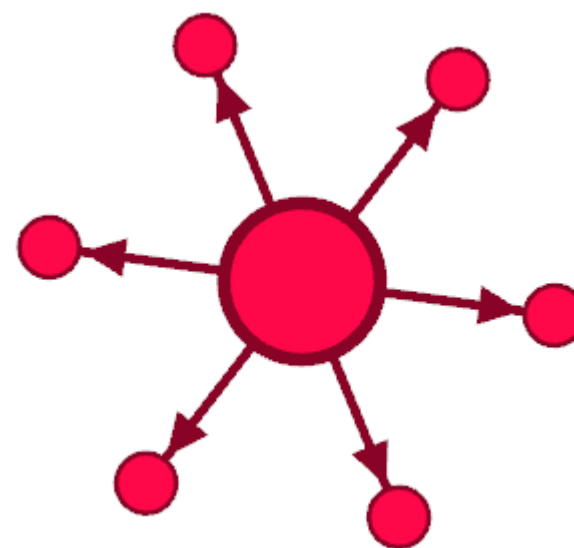
- Check the "Autoselect neighbors" option

without   with

Edges color

By default edges have the same color as their source node. This can be configured and a single color put instead.

• Expand ⬚ the visualization settings and go to the "Edges" tab

• Uncheck the "Source node color" and configure "Edge defaut color"
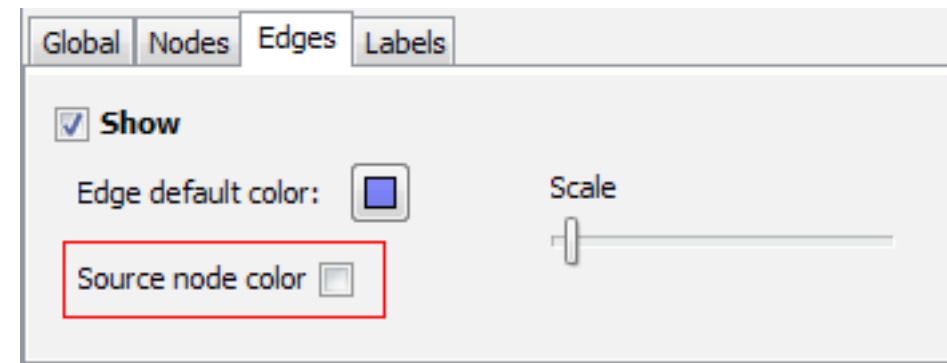
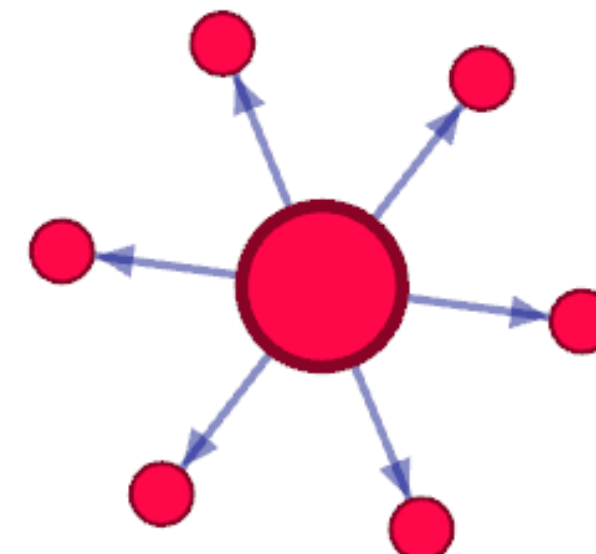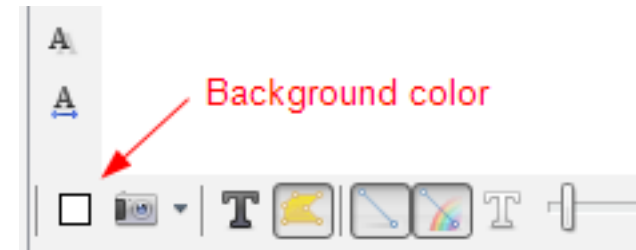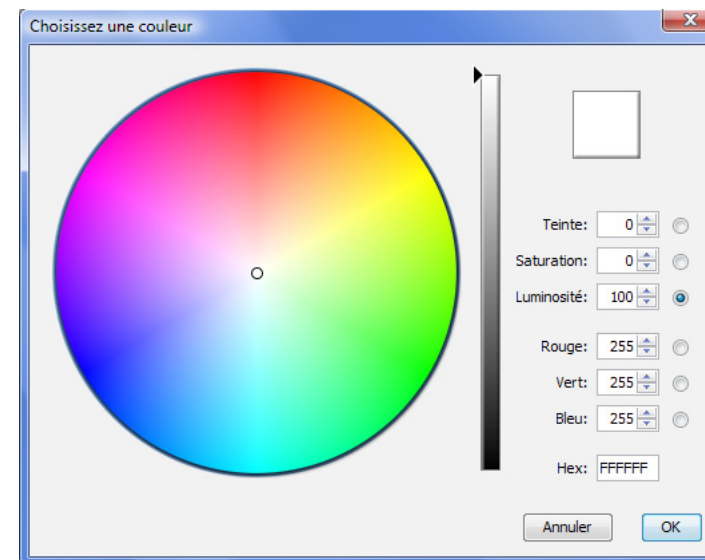
source color

user color

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Background color

- Click on the first button in the visualization settings

Background color

- Configure the color and click OK to confirm

Nodes shapes and 3-D

Although Gephi uses a 3-D rendering engine, networks are usually in 2-D and this is the default mode.
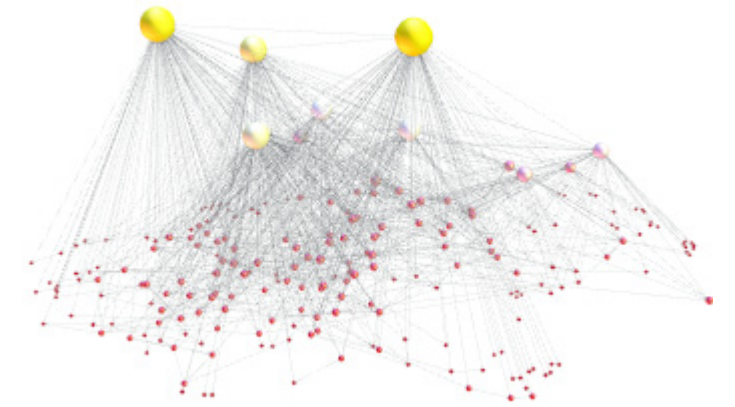
Let's see how to enable 3-D mode.

• Expand 🗎 the visualization settings and go to the "Nodes" tab

• Select "Sphere 3d" instead of "Disk 2d"

The aspect of nodes changes and it is now possible to move in 3-D space.

Keep <u>middle button</u> of your mouse pressed and move up and down to inclinate the view.

Show labels

• Locate the visualization settings related to text display
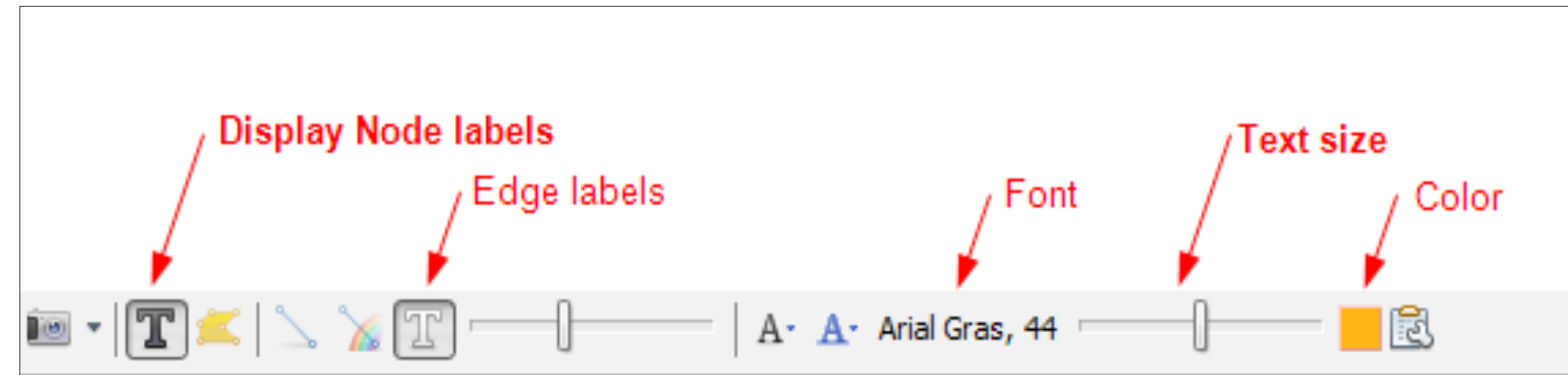
• Find the size mode button [A·] and pick "Node Size" option

  Size

  - Fixed   Independent of zoom magnification
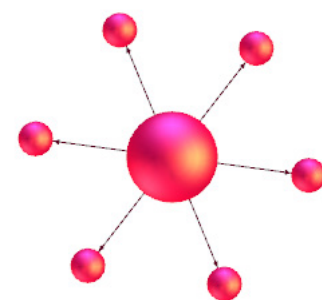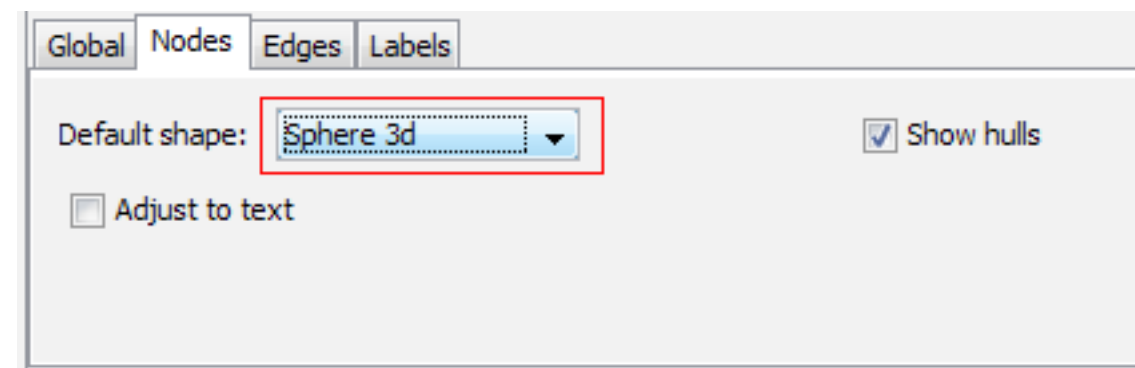 - Scaled   Label size depends on the zoom magnification
  - Node size   Depends on the node size

• The color mode [A·] allows to paint the label as its node color
  or as a unique color
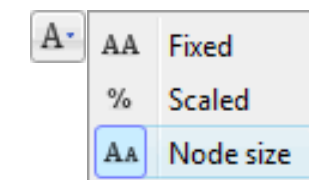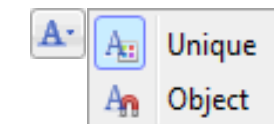
  Color

💡 **Font quality**

To have better font rendering, increase the Font size and reduce the text size.
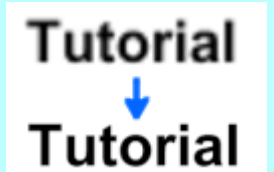
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Size mode

The differences between size mode ▣ in text drawing. One can see the text size on the right is proportional to the node's size.
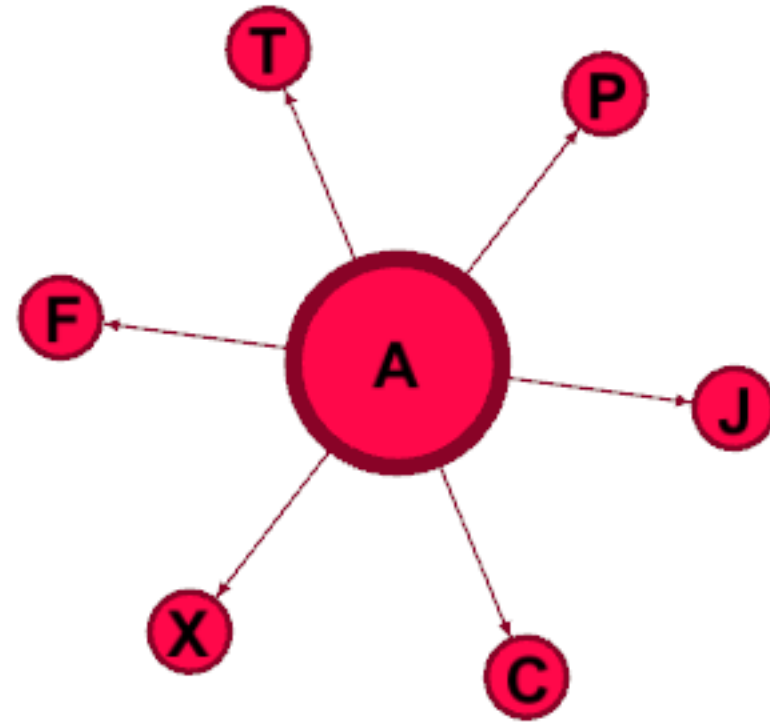
Fixed mode
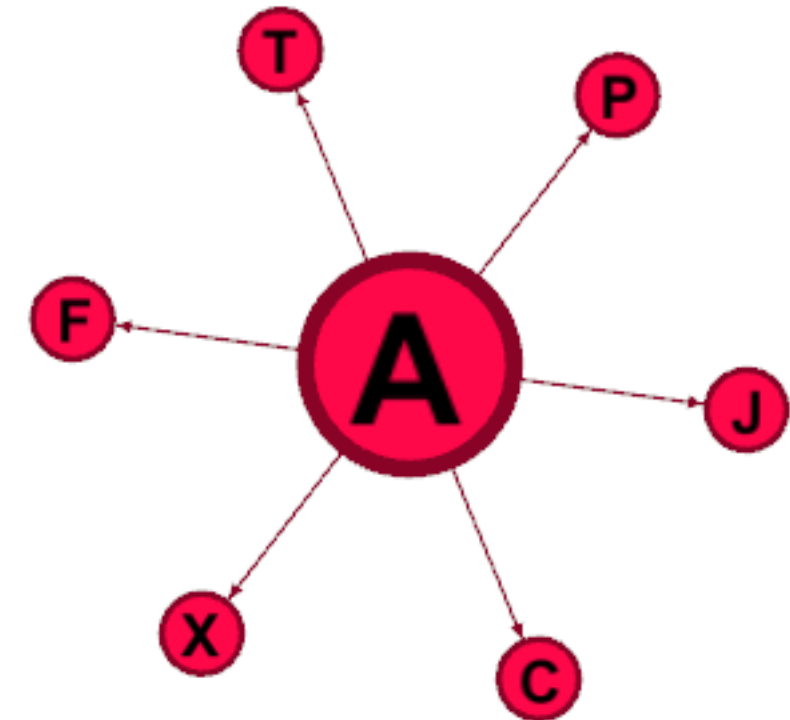
Node size

💡 Tip - Use compact fonts

To gain space, use compact fonts like Libel Suit or Yanone.

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Set label color

- Locate the color chooser in the visualization settings

Label color

- Press the left mouse to display the palette and pick a color

  (Right-click to get a complete palette chooser)

Saturated colors

This sets node label color. To configure edge label color, expand the settings bar
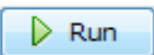
💡 Palette

Combine Alt, Shift and Ctrl (Command on Macintosh) to switch palettes on the fly.

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Label Adjust

Using the sample dataset with text display, labels are some-times overlapping. The "Label Adjust" layout can be run to avoid that.

• Go to the 📊 Layout panel

• Choose the "Label Adjust" layout in the list

• Click on ▷ Run to proceed
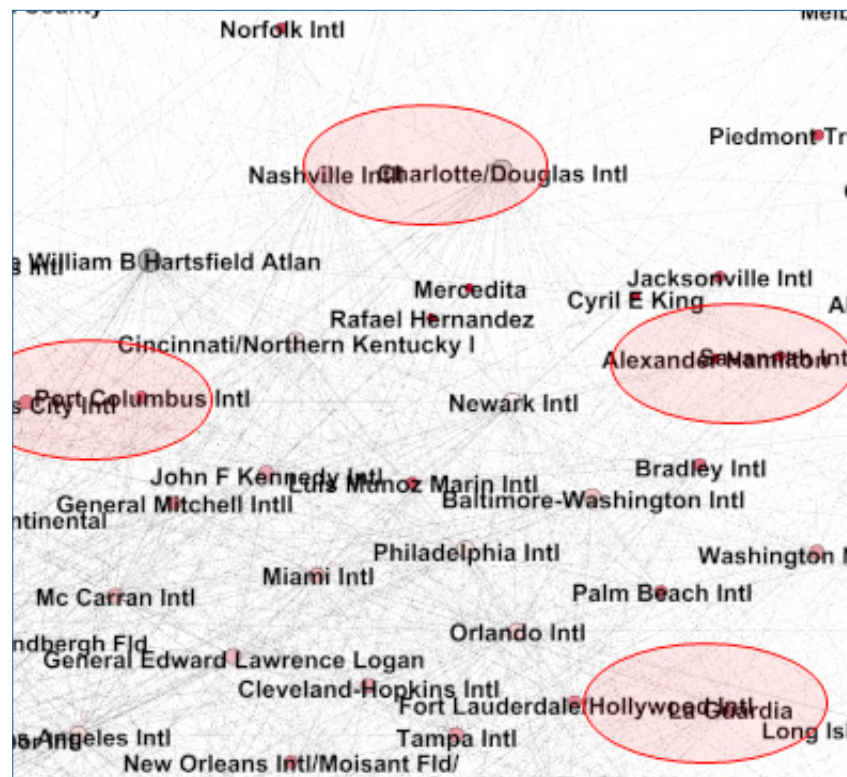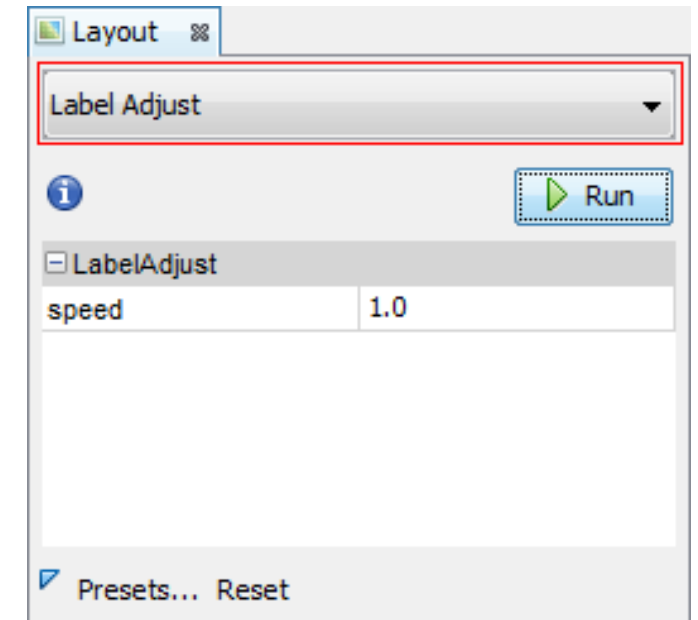
❌ Overlapping
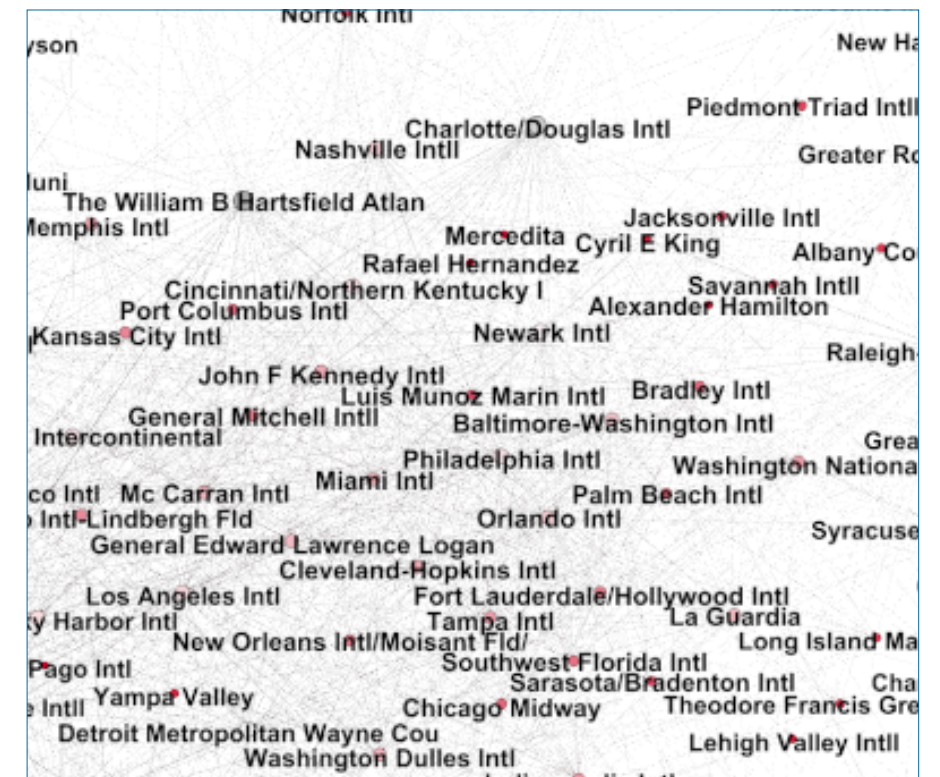
✔ Fine

Display attributes

Besides a label, nodes and edges have attributes, like gender, age or relationship type in a social network. It's easy to display them instead/with the label.

- Click on the "Attributes" button in the visualization settings.

Display attributes

- A dialog appears and lists all attributes, separated for nodes and edges.
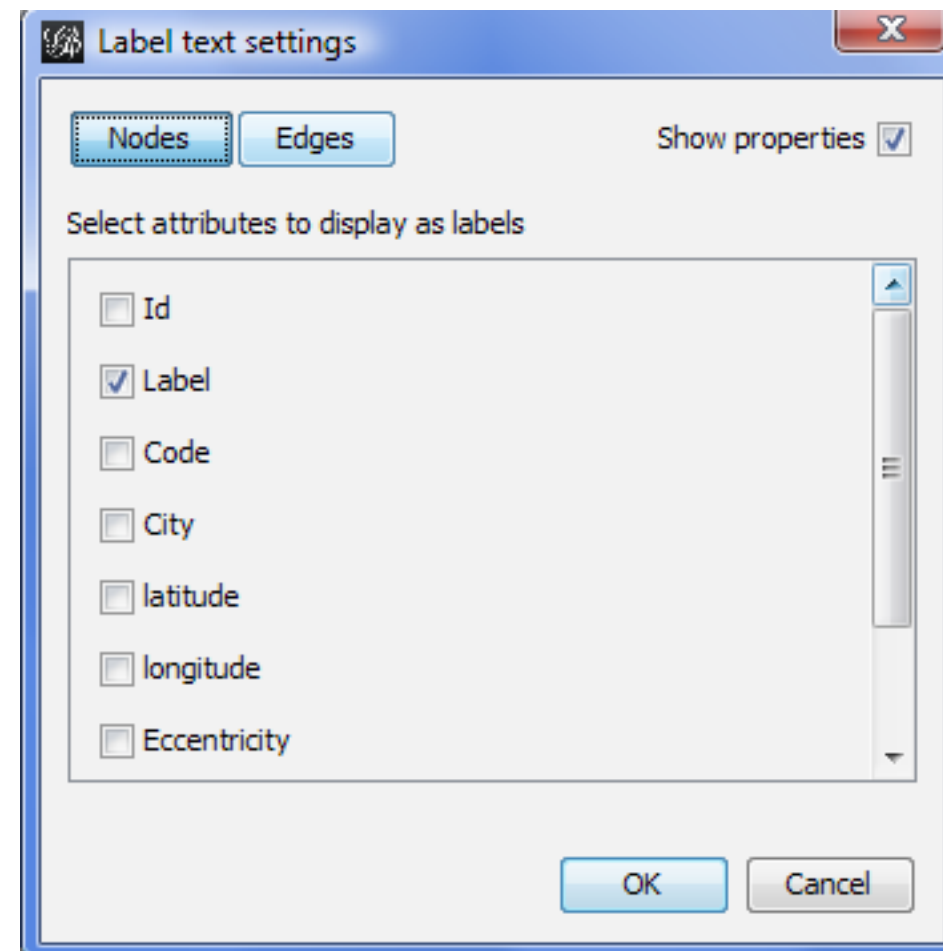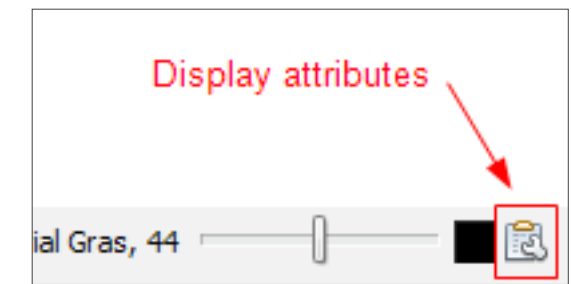
- Check all attributes you want to display, for instance "Code".

- Click on OK to confirm

Values will be displayed separated by a '-' character.

Display only selected labels

A useful option for showing labels only if elements are selected. Works for both nodes and edges.
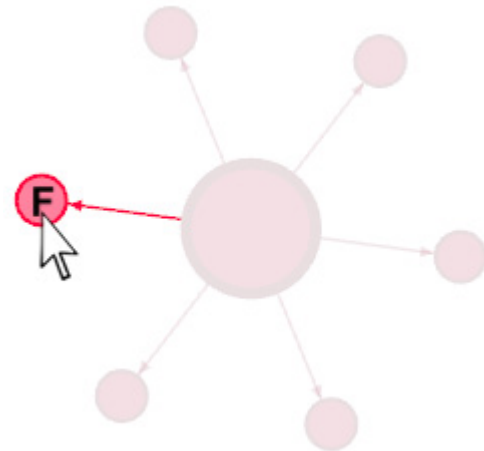
- Expand ⌂ the visualization settings and go to the "Labels" tab

- Check the "Hide non-selected" option
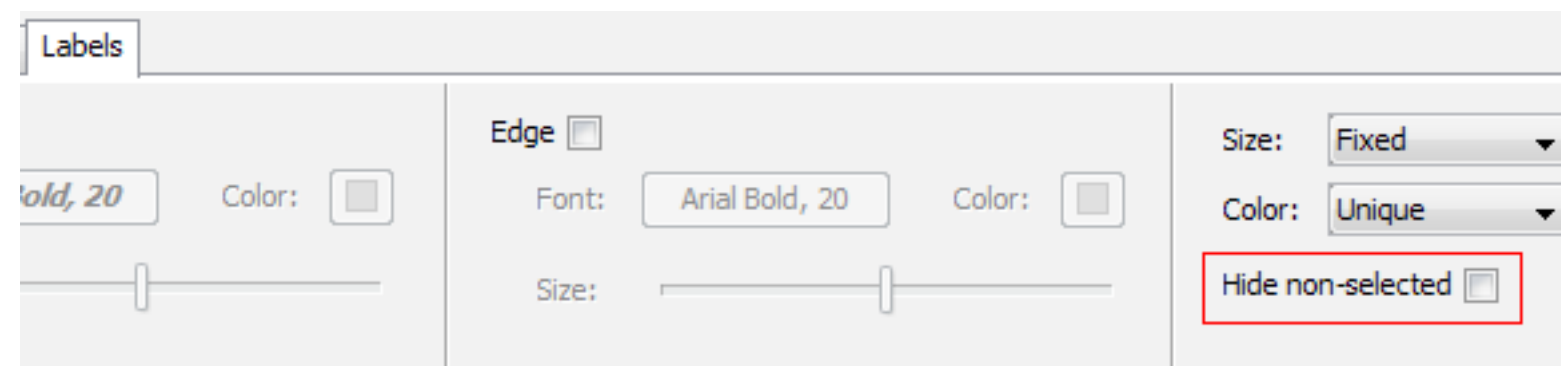
Antialiasing option

Antialiasing is a visualization option which makes edges look smoother. It is set at 4x by default and can go up to 16x.

• Go to Gephi options in the "Tools" menu
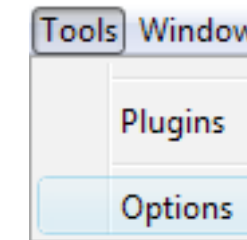
• Select the "Visualization" tab and then the "OpenGL" tab.
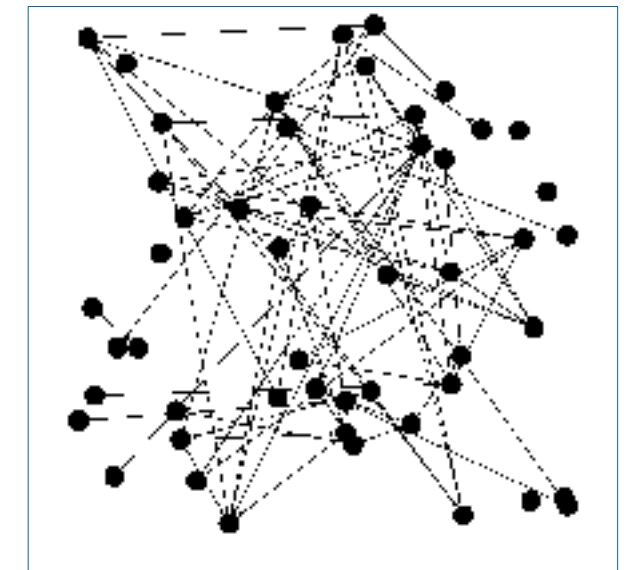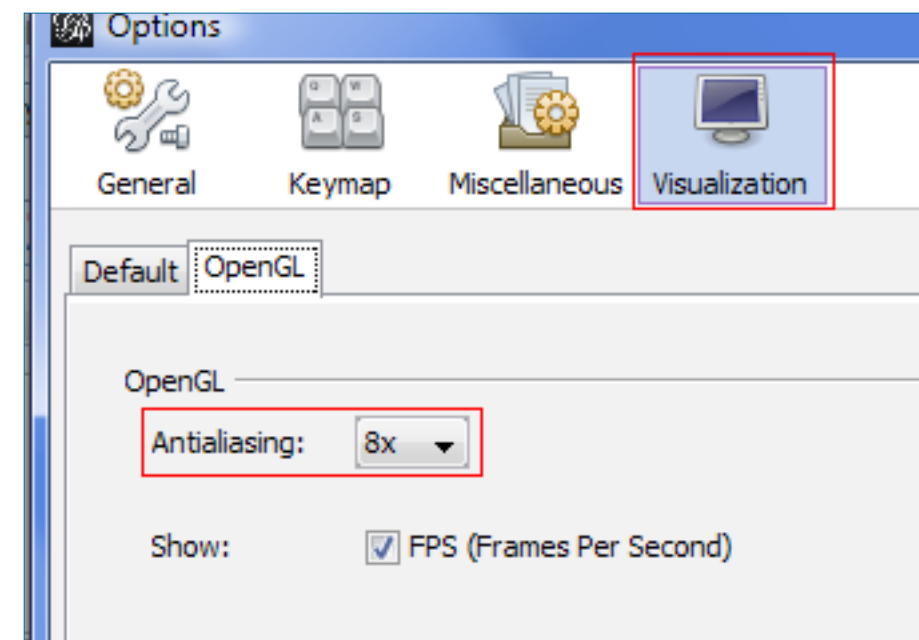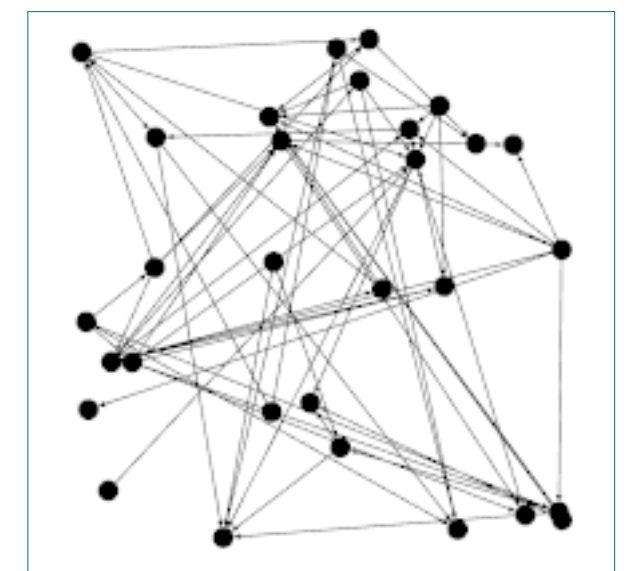
• Here you can change the antialising option. Restart Gephi to validate the changes.

The best value is 16x but is not supported on all hardware. It is recommended to update your graphics driver to profit from maximum performance in Gephi.

0x

16x

Take screenshots

Gephi can take high-resolution screenshots of the current visualization window. Screenshots images are exported in PNG format.

• Find the camera icon in the visualization bar

• Click on the down arrow to access the settings panel
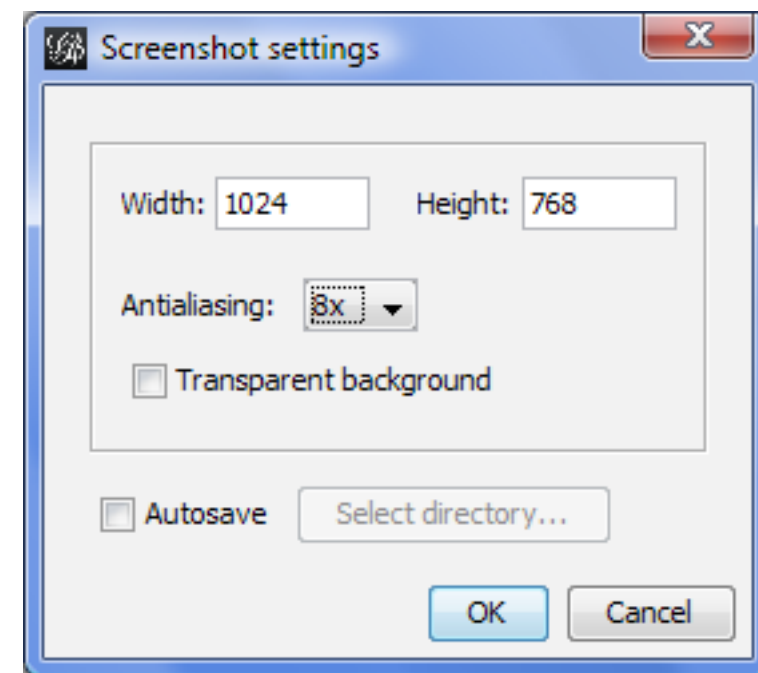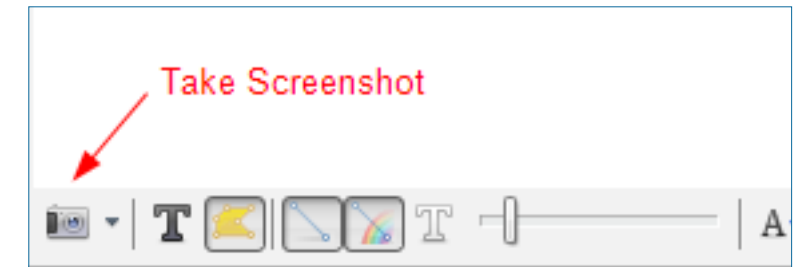
High-resolution screenshots depend on your computer capabilities. Screenshot with higher resolution looks better but have a larger file size.

Antialiasing makes edges smoother. Note that 16x is not supported on all hardware.

With good hardware you can go until 16000 width and 16x antialiasing.

• Click on the 📷 icon to take the screenshot. The interface will appears frozen during execution. That is normal, just wait few seconds until the process ends.

Tools

Tools are available in the toolbar and allow various interactions with the graph window or graph elements (nodes, edges). They can react on mouse click, selection, drag or more complex scenario like "moving up while pressing".

• Click on the first tool, the "Painter" and hold mouse button to color selected nodes.

You can see properties related to tools are located in the upper properties bar

Properties bar

• Try now the pencils tools to create new nodes and edges. Increase default node size to make them more visible, set 10 instead of 1.
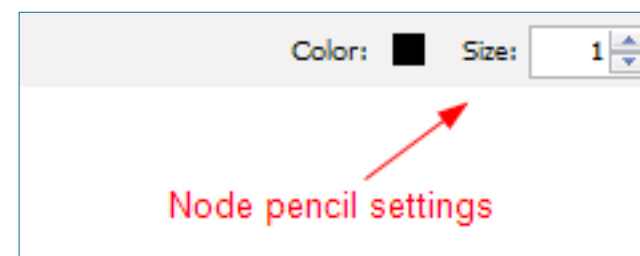
Node pencil settings

Shortest Path tool

Visualizing the shortest path between two nodes can be done with a tool easily.

- Click on the shortest path tool ✈ in the toolbar

- Click on a node (the source node) and then on the target node
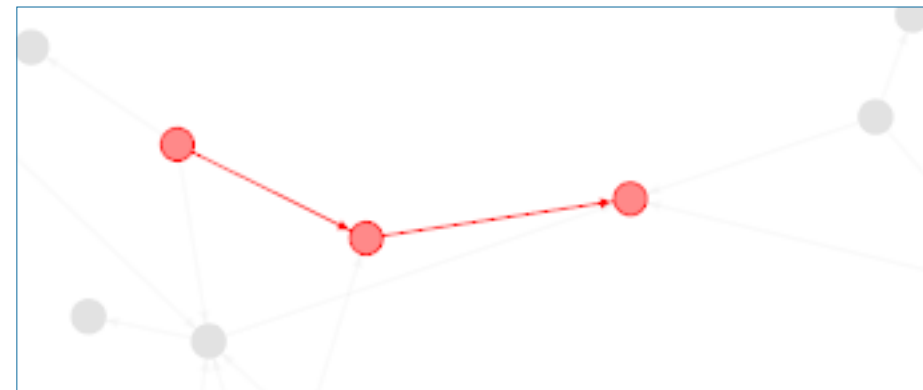
The path is colored and nodes are selected. If no path is found, the properties bar indicates "No path exists between these two nodes". The distance is given otherwise. Note the distance takes edge weight in account.

- Click elsewhere on the window to unselect the nodes. And use "Reset Color" action to remove the red color.

Reset color after using shortest-path
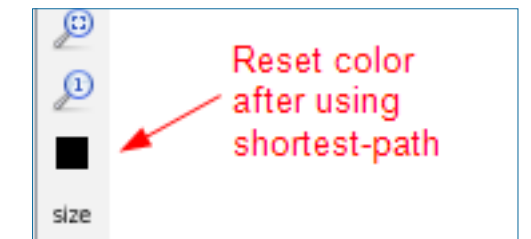
💡 Undirected graphs

Note that the shortest path is not the same for directed and undirected graphs.

Heatmap tool

Working with network distance like the Shortest Path tool, the Heatmap gives distance from a single node point of view. It can easily highlight the closest or the farthest reachable nodes.

- Select the Heatmap ⚙ tool

- Configure the gradient like below. Double-click on the triangles to change color.

Gradient:

- Use the airlines sample dataset and click on a node. Farthest reachable airports are painted in red. The properties bar also indicates the max distance value. Compare Detroit, a well connected airport and a less central one.

Heatmap from the Minneapolis airport.

Red nodes are airports reachable in two steps, the maximum distance.

Edit tool

Edit tool is a convenient way to edit your data directly from the visualization window, and in particular labels.

• Select the Edit tool 🖊 in the toolbar

Notice a new panel just appears on the left.

• Click on a node to edit its label or attributes. Press always ENTER key to validate the changes when you edit a value.

136		
Id	136	...
Label	136	...
latitude	44.883333	
longitude	-93.216944	

Edit panel
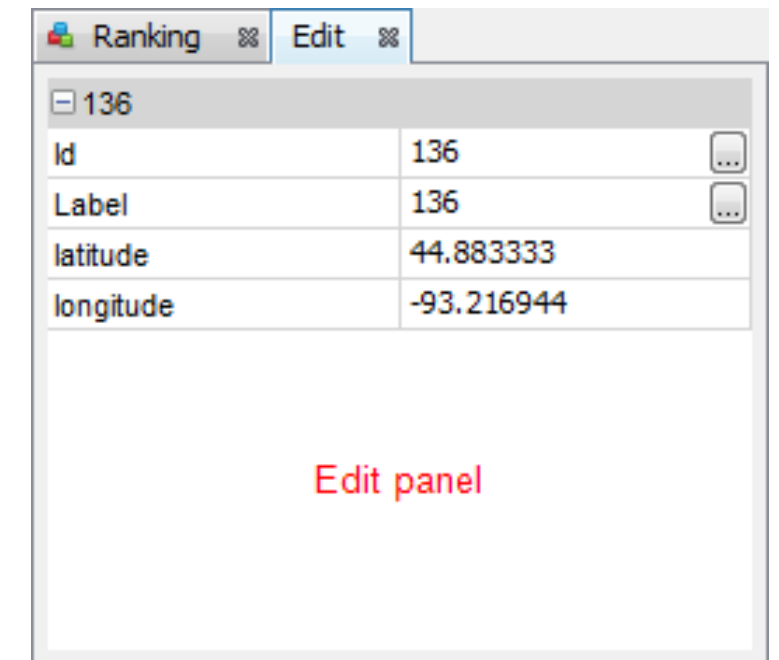
Edge edit is not available for the moment but will be developed in a future version.

💡 **Find more Tools**

Developers can easily add new tools to Gephi. Consult the Plugin Center to see what is available.

And share your tools ideas and suggestions on the Gephi forum.

Bonus

Text color and size can be used as a visual sign to express higher influence or any other characteristic. To conclude this tutorial, let's see how to do something like below.

Transform text color and size

The Ranking module will be used to do that.

- Find the label color 🅰 transformer and select which attribute to use for ranking. Here the "Degree" is chosen.

- Configure the ranking colors and click on ▷ Apply

The text should be colored now. Try also to use "Betweenness Centrality" instead of "Degree".

- Now select the label size 🅰 transformer

- Select sizes between 0 and 1, as this size value is multiplied with the default element size

- Click on ▷ Apply to see how the text size changes
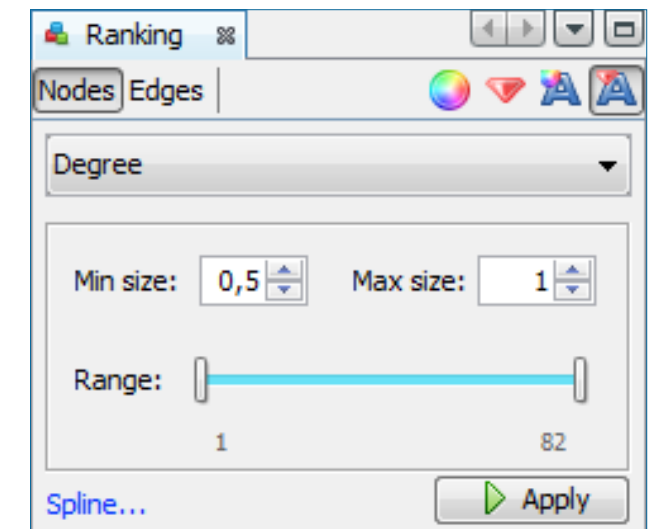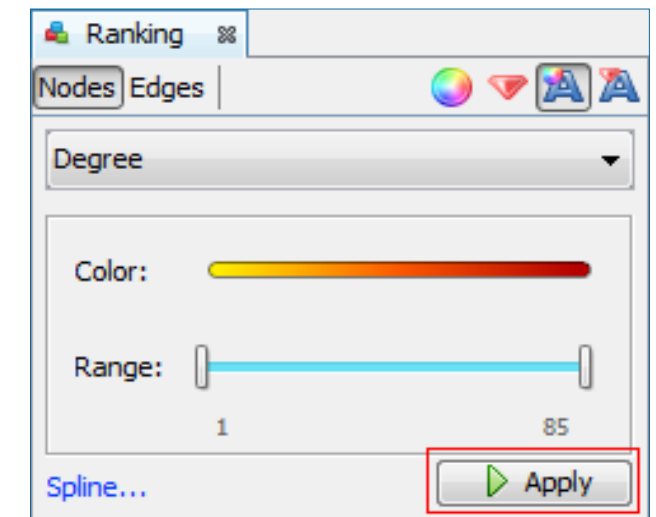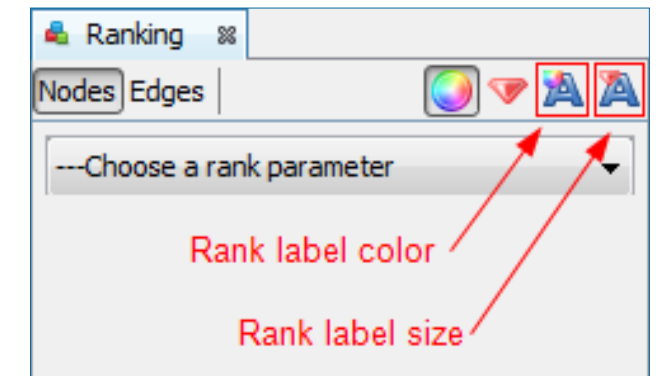
💡 **Reset transformations**

Click on "Reset label color" and "Reset label size" to reset text aspect.
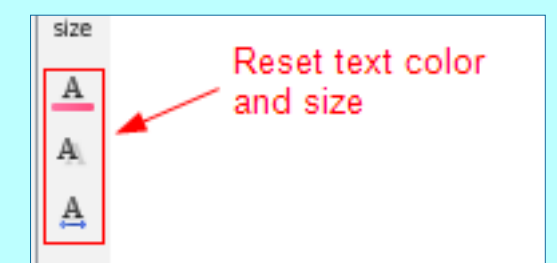
Conclusion

In this tutorial you learnt more about Gephi's visualization capabilities and the essential settings. You are now mastering text drawing and are ready to produce more readable and nifty-looking results. You discovered interactive features like Tools and know how to configure them.

A future tutorial may focus only on tools and provide details about all of them. In the meantime you're welcome to ask all the questions you want on the forum. The Gephi community can help you.

Go further:
    🌐 Gephi Website
    🌐 Gephi Wiki
    🌐 Gephi forum