

COMP5048 Week 5 Tutorial

A. Gephi

Gephi is a graph visualisation & analysis software written in Java.

1. Gephi installation instructions

1. Install Java version 7 or 8 from <https://java.com/en/download/> if you haven't already.
2. Go to the Gephi website at <https://gephi.github.io>.
3. Download the appropriate installer/archive for your system.
4. Run the installer or decompress the archive.
5. Go to the installation directory and open the executable from the bin folder.

2. Examples runthrough

2.1 Drawing graphs

1. Open the Gephi executable.
2. Under "Samples" on the "Welcome" window, select "Les Miserables.gexf". Select "Undirected" under "Graph Type", leave other options unchanged, and click "OK".
3. You should see a graph drawn on the main window. Try to navigate around by using right-click drag or zooming with mouse wheel.
4. The appearance of the graph (e.g. node shape, edge colour) can be modified from the visualisation pane, which can be expanded using the arrow button on the bottom rightmost of "Graph" tab.
5. To show node labels, go to the "Labels" tab and check the "Node" checkbox.
6. To create a screenshot, click the camera icon on the bottom of the "Graph" window.

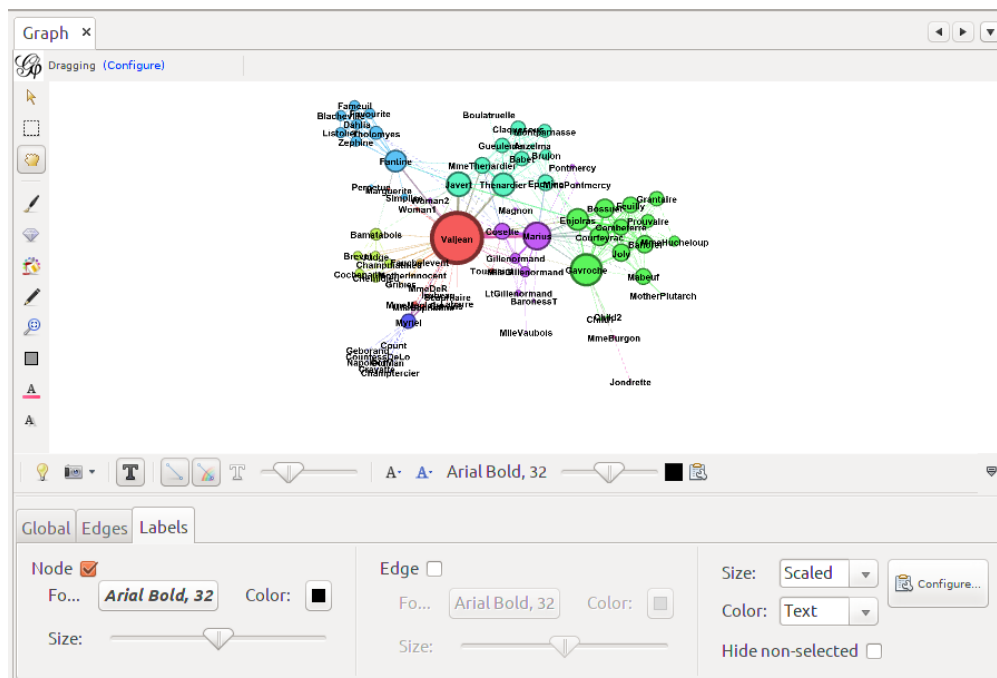


Figure 1: Graph tab

2.2. Graph layouts

1. A number of layout options can be chosen from the "Layout" sidebar. Select "Force Atlas" from the drop-down menu and click "Run".

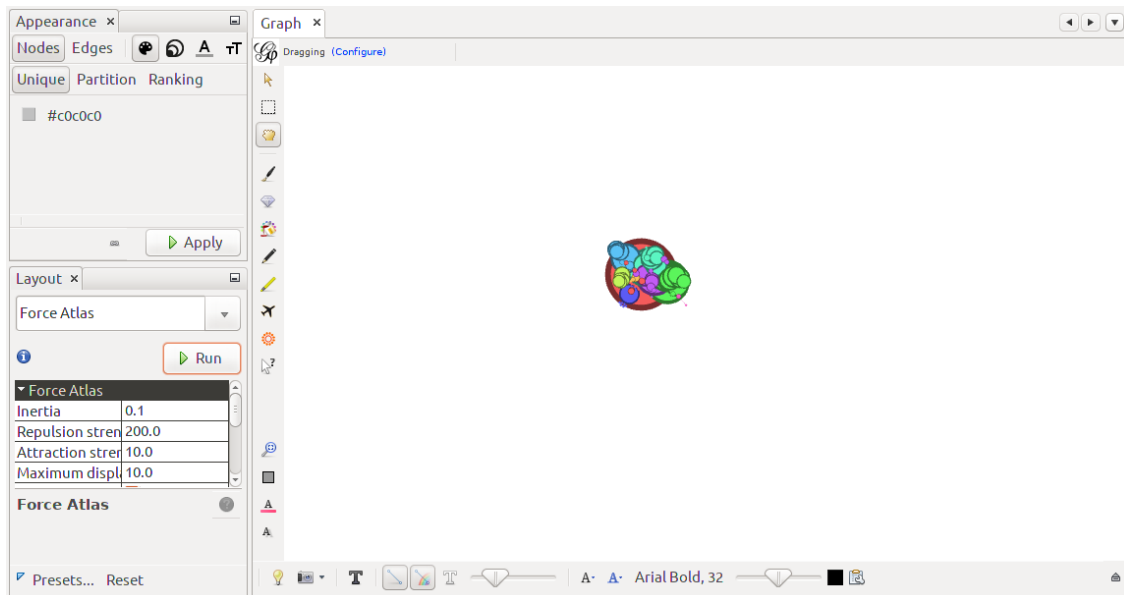


Figure 2: Force Atlas layout with default parameters

2. The resulting layout may result in too many overlapping nodes. Click "Stop", try increasing the repulsion strength and/or decreasing the attraction strength, and click "Run" again. Repeat if necessary until you have a satisfactory layout (e.g. less node overlapping).

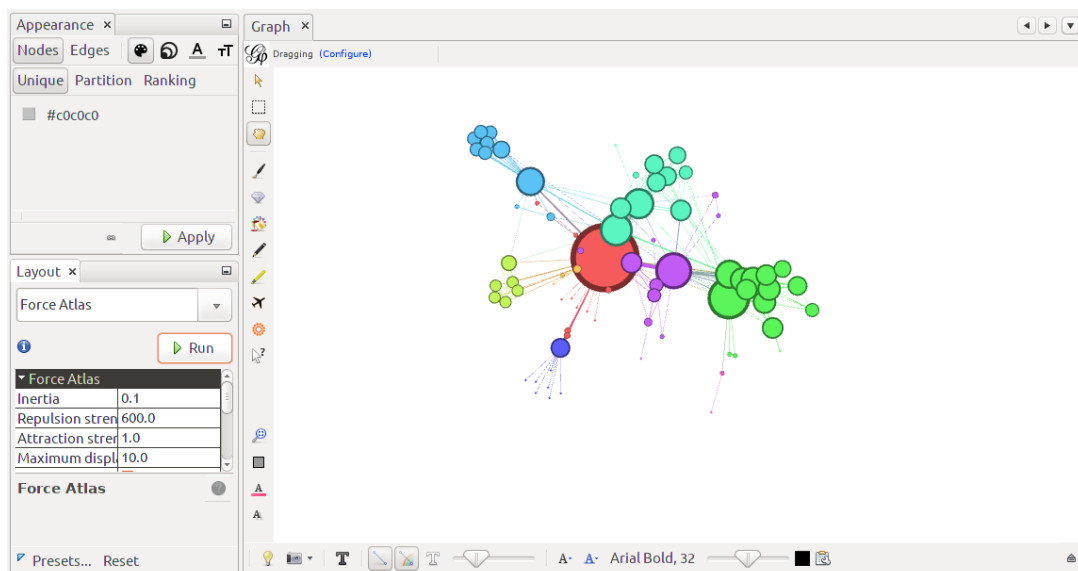


Figure 3: Force Atlas layout with modified parameters

3. If you wish, you can try other layout options. Note: The options "Rotate", "Contraction", "Expansion", as well as "Label Adjust", are not layout algorithms, but tools to modify the current layout.
4. Save the output as a Gephi project.

B. Tulip

Tulip is a graph visualisation software written in C++.

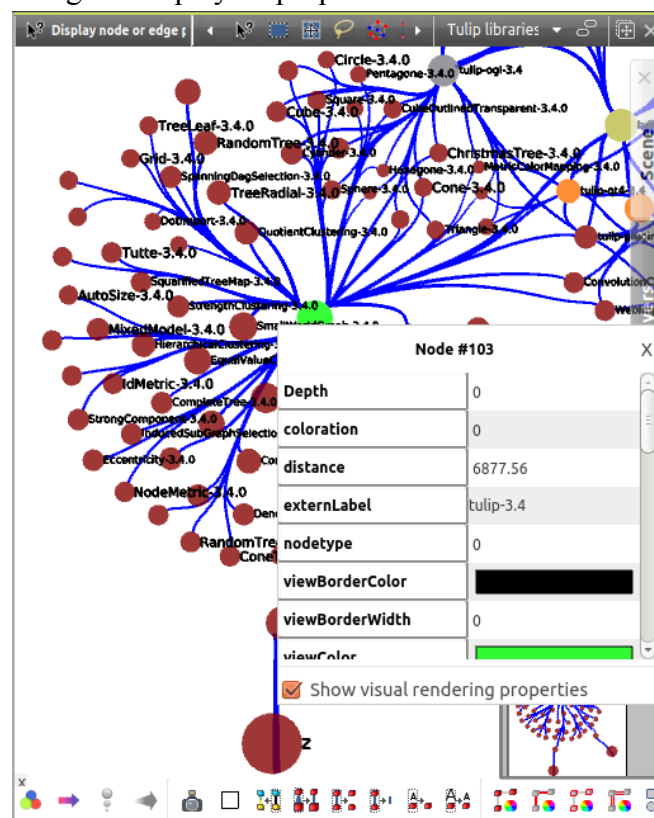
1. Tulip installation instructions

1. Go to the Tulip homepage at <http://tulip.labri.fr/TulipDrupal/>
2. Click the button to download the latest release for your system
3. If you are running Linux and/or want to build from source, locate the latest version at <https://sourceforge.net/projects/auber/files/tulip/> and download the .zip or .tar.gz containing the source. You will need CMake to be able to build the application.

2. Examples runthrough

2.1. Loading & exploring projects

1. Open the Tulip executable.
2. Click “Open project” and open tuliplibdependencies.tlp.gz. The perspective window will open.
3. On the right-hand side, you will see the drawing of the graph and you will be in “Navigate in graph” mode. Left click-drag to navigate around the visualisation or scroll to zoom.
4. To go to “Display node or edge properties” mode, click the cursor+question mark button. Click on a node or edge to display its properties in this mode.



5. Figure 4: Displaying a node property in TulipExpand the graph sub-window to show all of the icons in the bottom toolbar; hover over each button to check their functions. These can be used to change the appearance of the graph, e.g. show/hide nodes, edges, and labels, change node/edge colours/shapes, etc.
6. Save your project with “File” → “Save”, and save a snapshot from the camera icon below the graph (“Take a snapshot”).

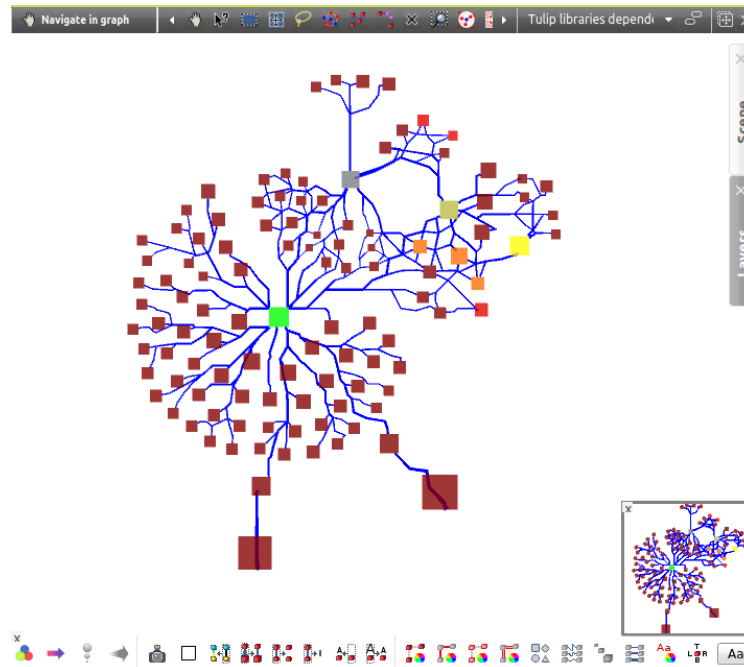
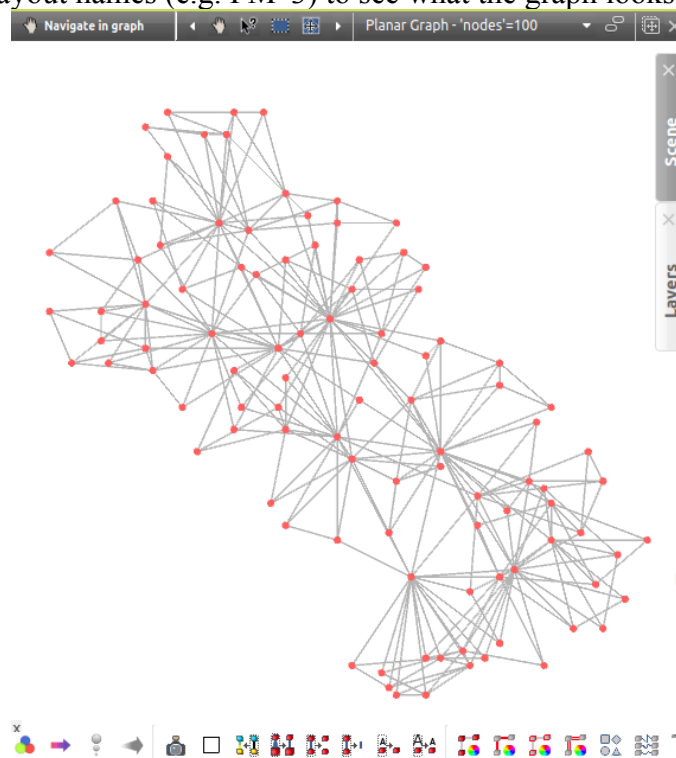


Figure 5: Graph with square nodes & polyline edges

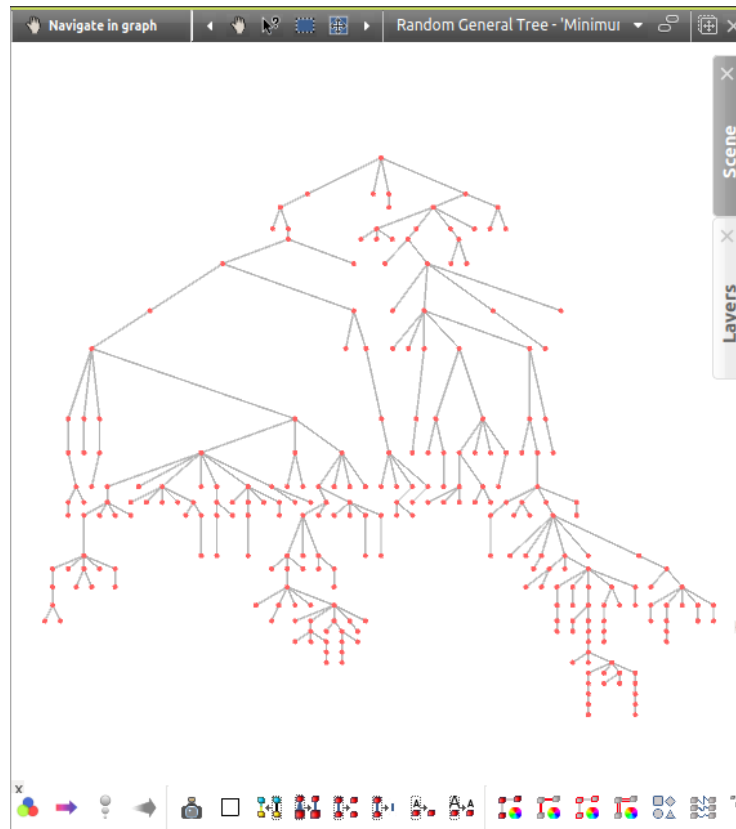
2.2. Generating & drawing graphs

1. Click “File” → “Import”.
2. Select “Planar graph”, set the number of nodes to 100, and click “OK”.
3. On the left-hand side (“Algorithms”), scroll down to “Layout” → “Force-directed”. Click on one of the layout names (e.g. FM³) to see what the graph looks like with the layout.



4. Figure 6: generated planar graph with FM³ layoutTry generating a tree: from “File” → “Import”, select “Random General Tree”, modify the parameters as wanted (aim for 100 as the minimum size) and click “OK”.

5. On the left-hand side, scroll down to “Layout” → “Hierarchical” and choose the desired layout, e.g. Sugiyama.



6. Save the project as a Tulip project (.tlpx extension).