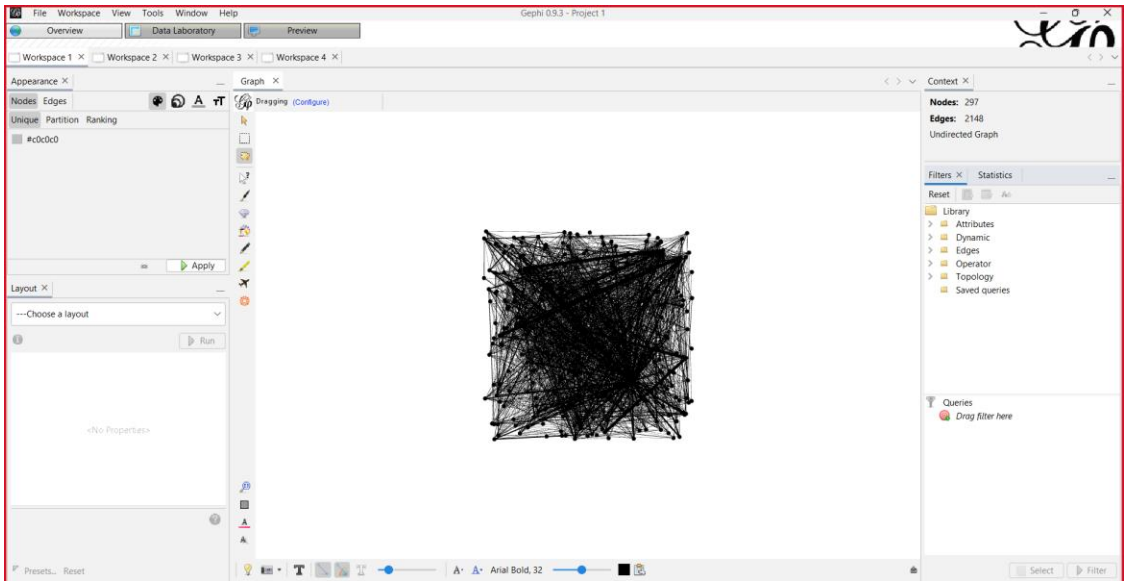
CELEGANS NEUTRAL

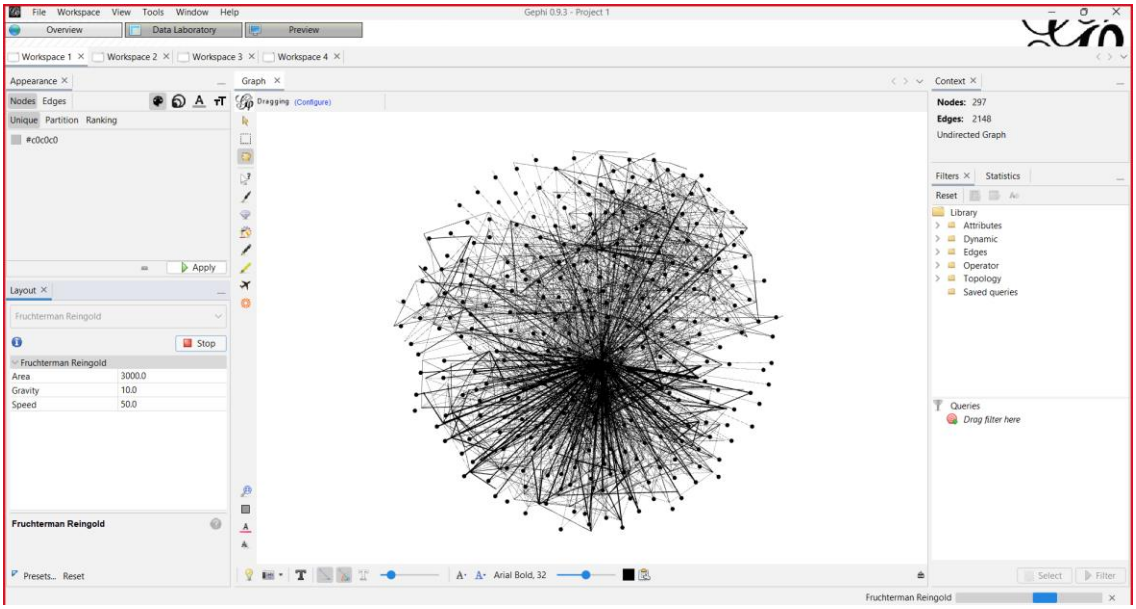
The file celegansneural.gml describes a weighted, directed network representing the neural network of C. Elegans. The data were taken from the web site of Prof. Duncan Watts at Columbia University. The nodes in the original data were not consecutively numbered, so they have been renumbered to be consecutive. The original node numbers from Watts' data file are retained as the labels of the nodes. Edge weights are the weights given by Watts.

STEPS

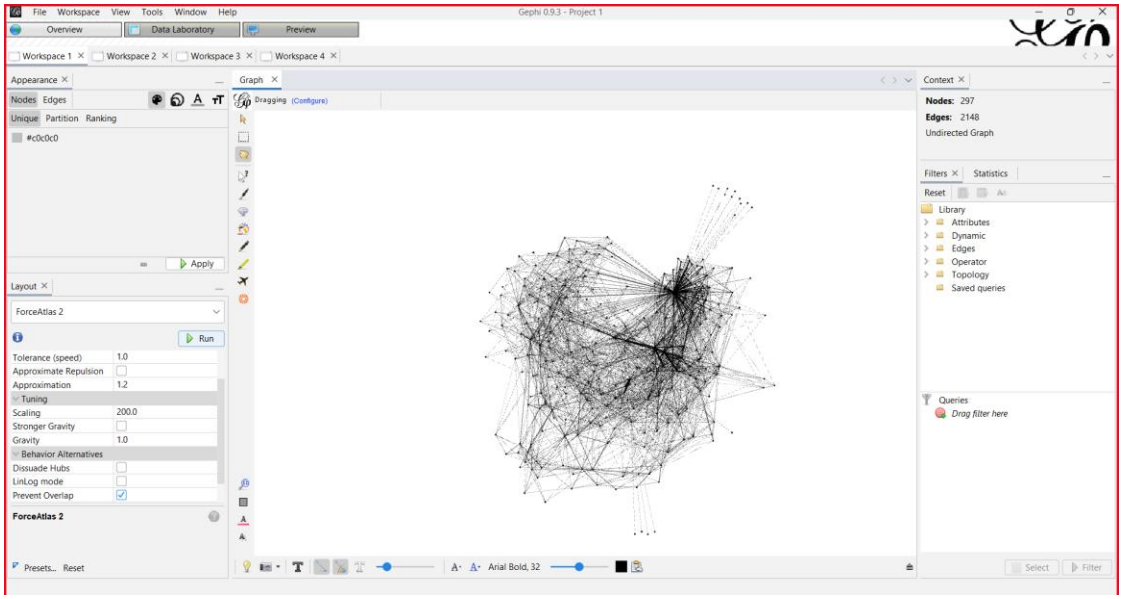
1. From the File menu, select Open and then select the .gml file that we saved! At first it sort of looks like a big hairball, so we'll change the layout to make some sense of these connections.



2. We changed the Layout to Fruchterman Reingold first and changed the area to 3000 and speed to 50. This layout **simulates nodes as mass particles, and edges as strings**. Then, it just minimizes the energy of the system.



3. From the Layout module on the left side, we chose Force Atlas 2 from the dropdown menu with the scaling 200 and prevent overlap, while leaving the other values as it is. Force Atlas makes the connected nodes attracted to each other and pushes the unconnected nodes apart to create clusters of connections!

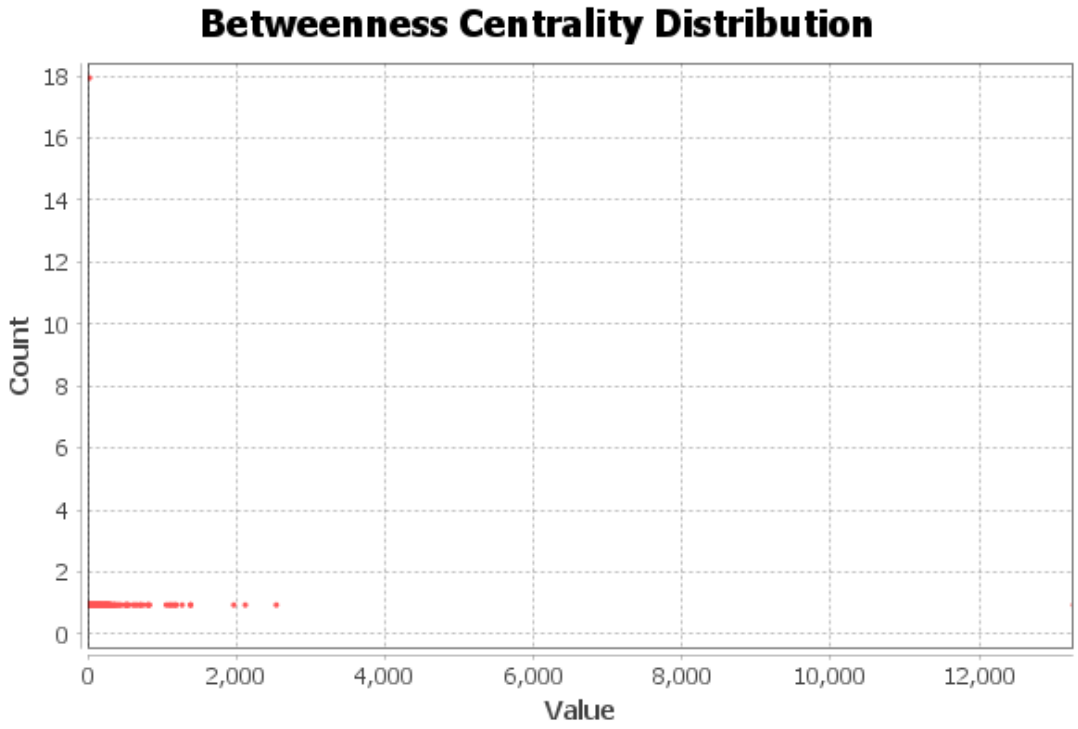


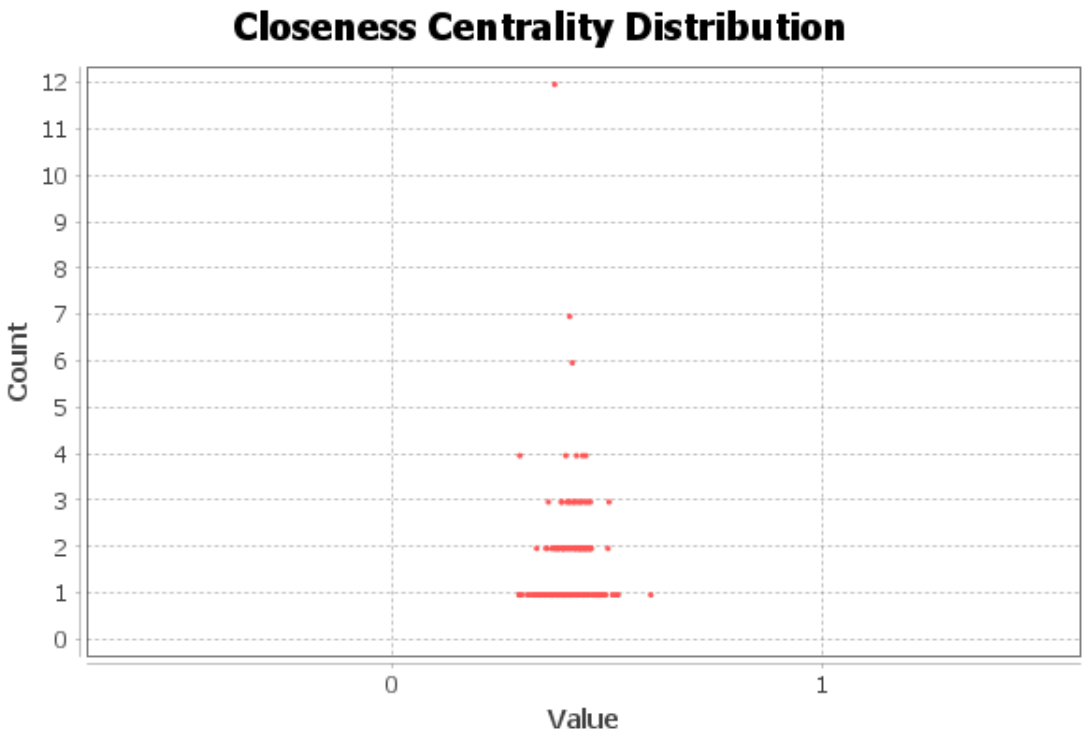
4. Click the Statistics tab in the top right module. Run the Average Path Length. Graph distance reports will pop up.

Diameter: 5

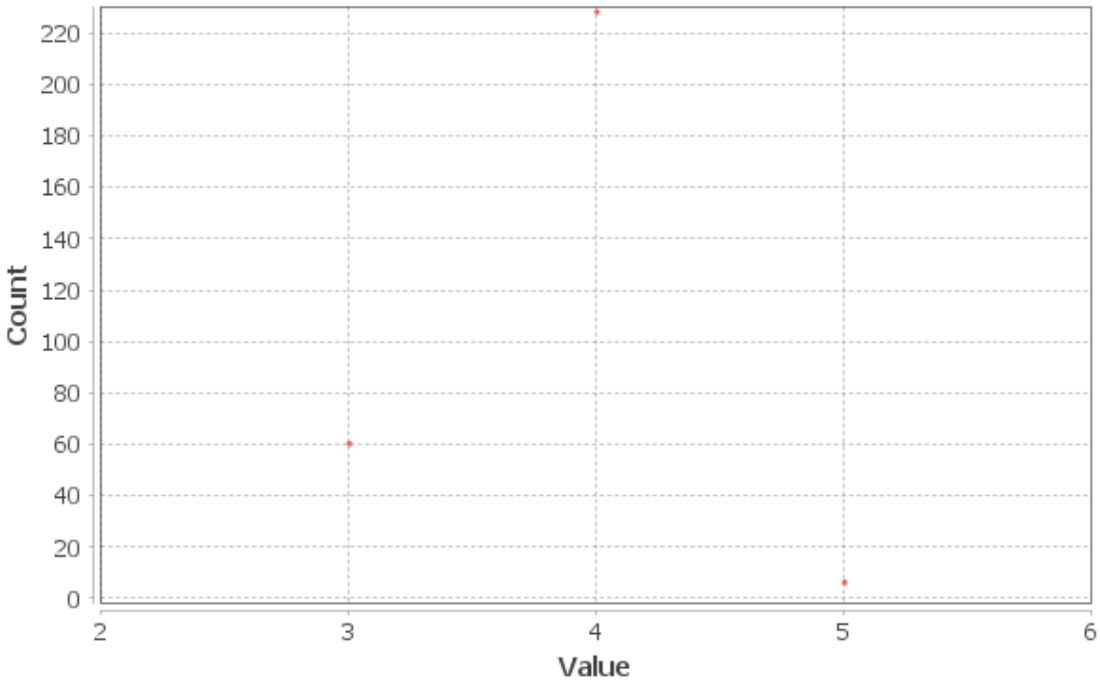
Radius: 3

Average Path length: 2.455318955318955

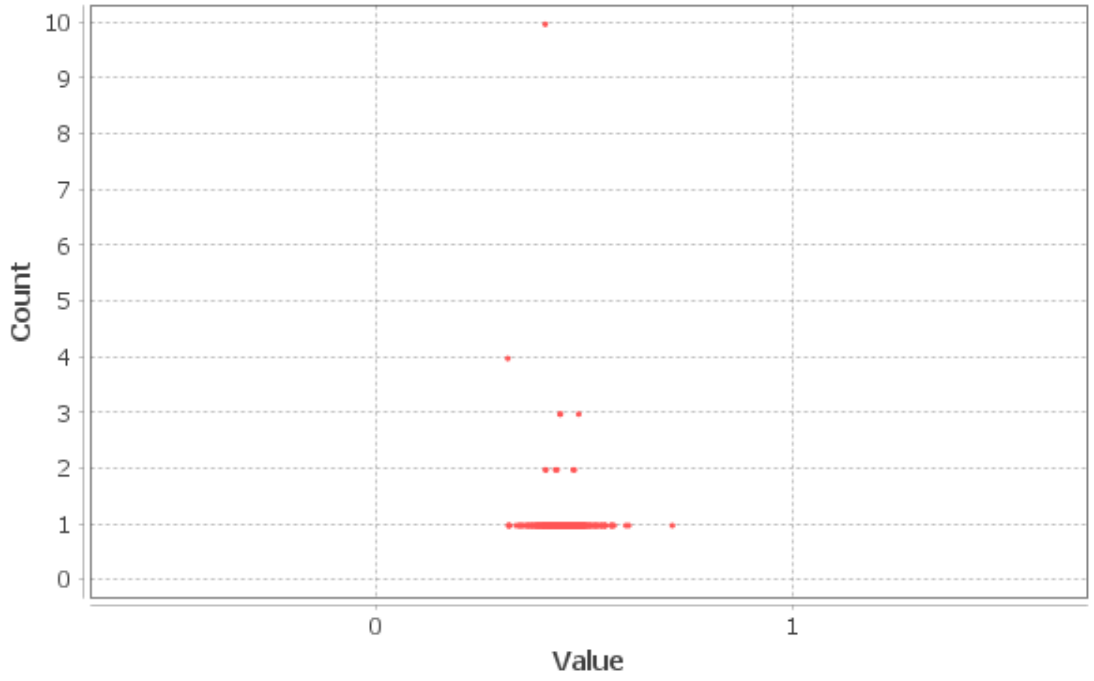


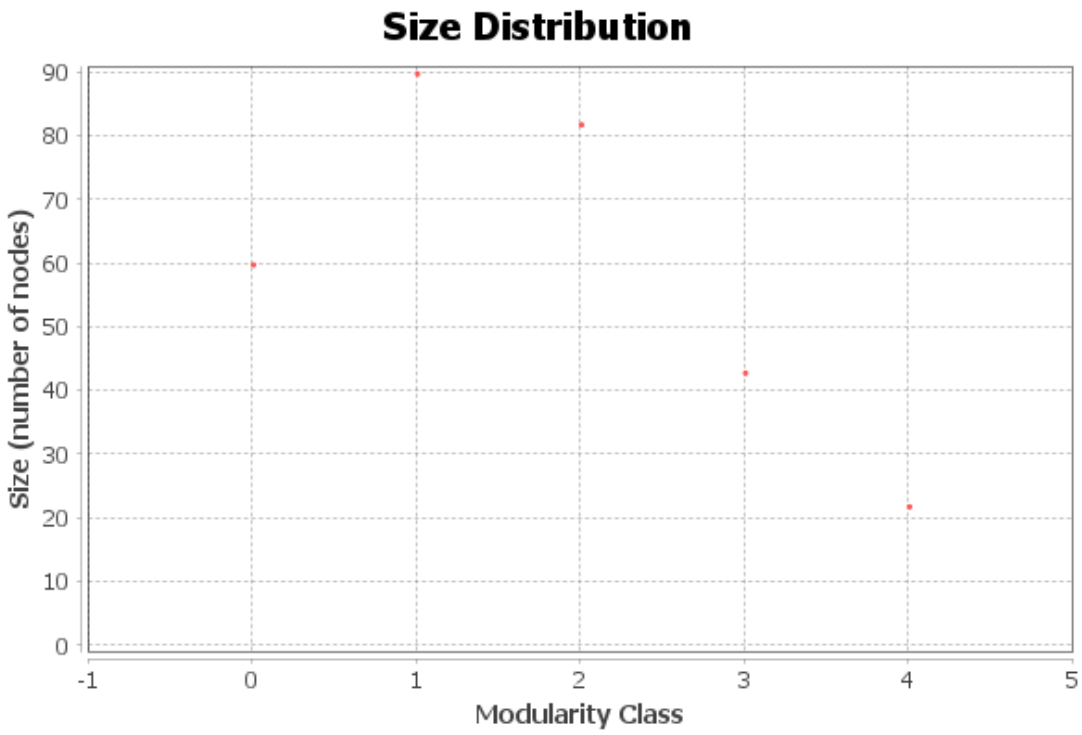


Eccentricity Distribution

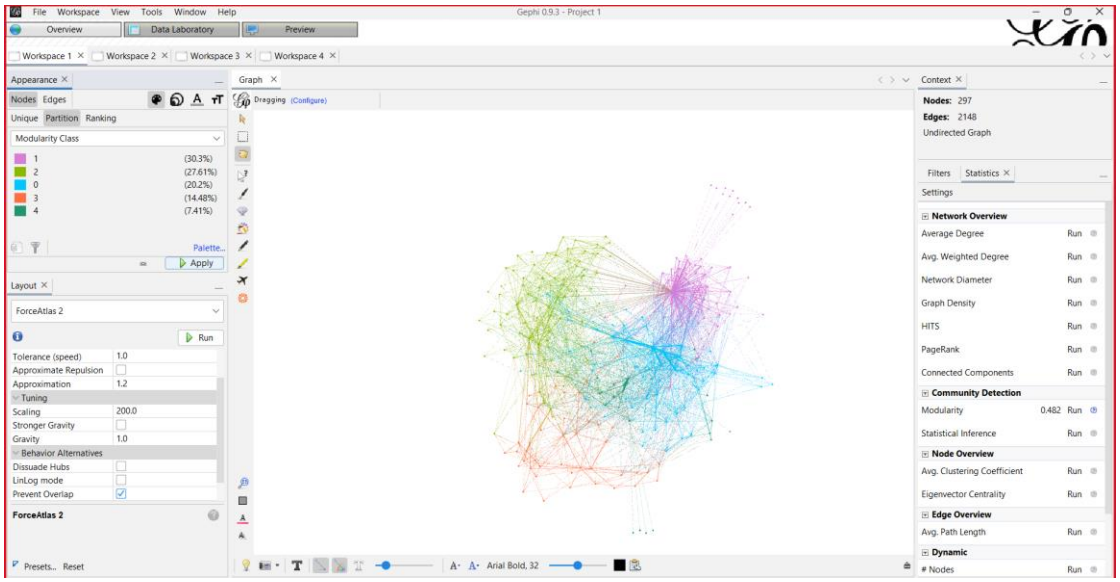


Harmonic Closeness Centrality Distribution

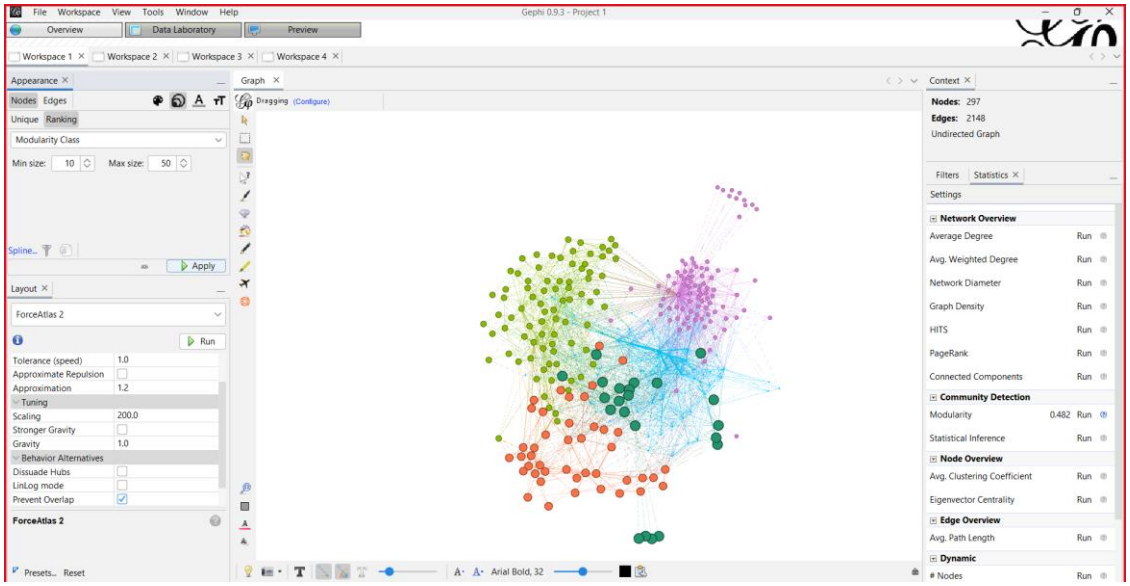




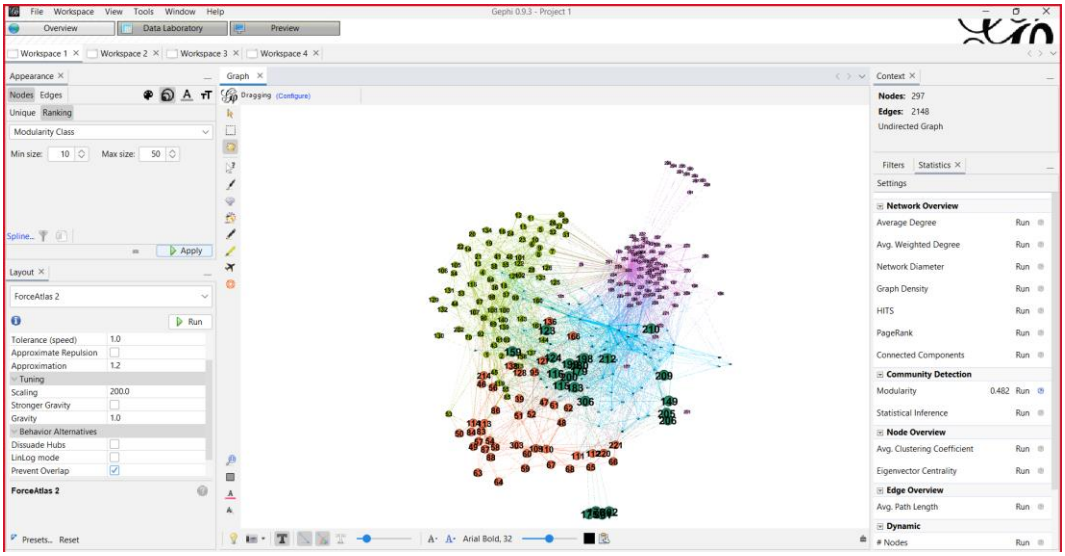
5. Ran Modularity, from modularity classes in the partition tab in the color palette.



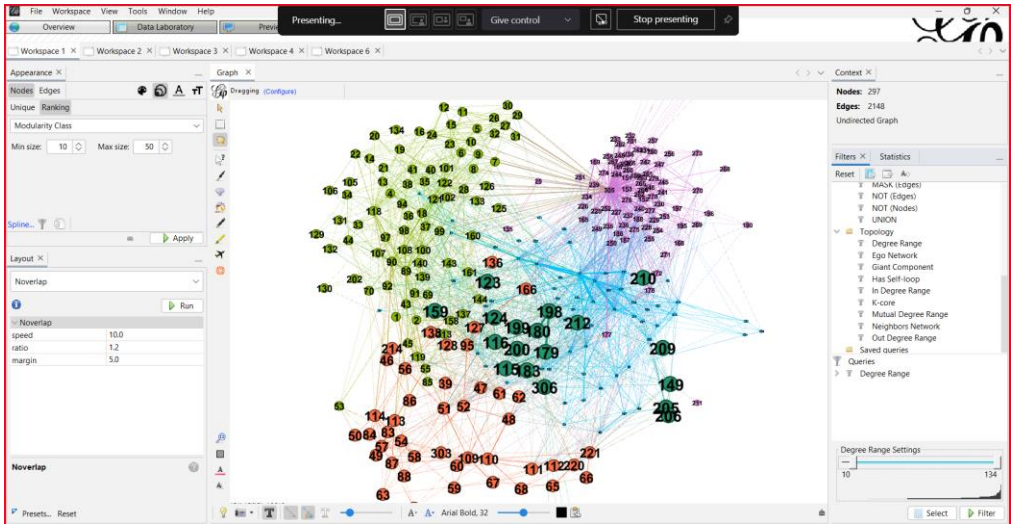
6. Choose Modularity Class from the Ranking tab. Click on the icon for size and set Min Size to 10 and Max Size to 50.



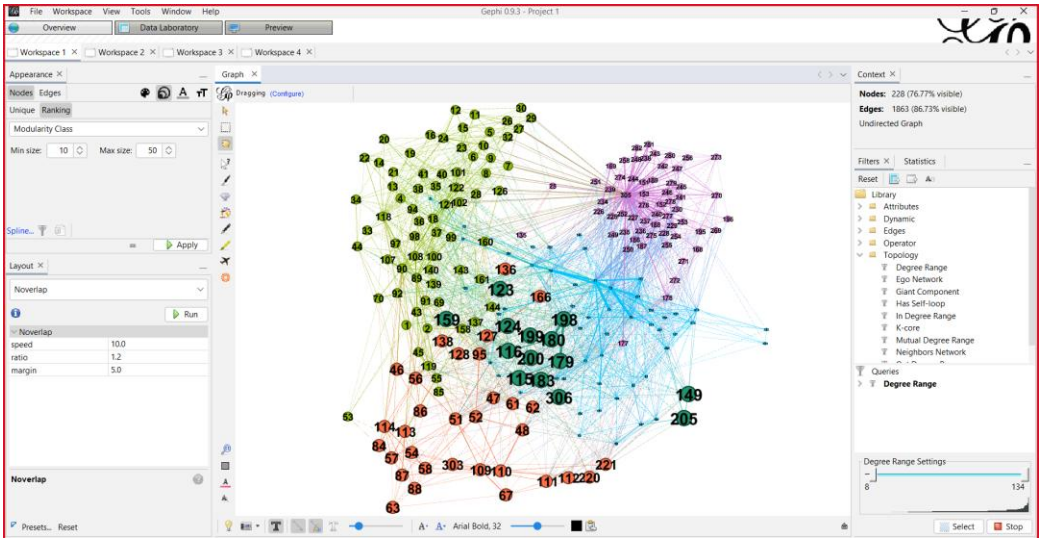
7. Click the bold black T in the toolbar at the bottom of the window to put on the Labels on the nodes. Click the black letter A in the same toolbar to select the Size Mode for the labels, and choose the Node Size option.



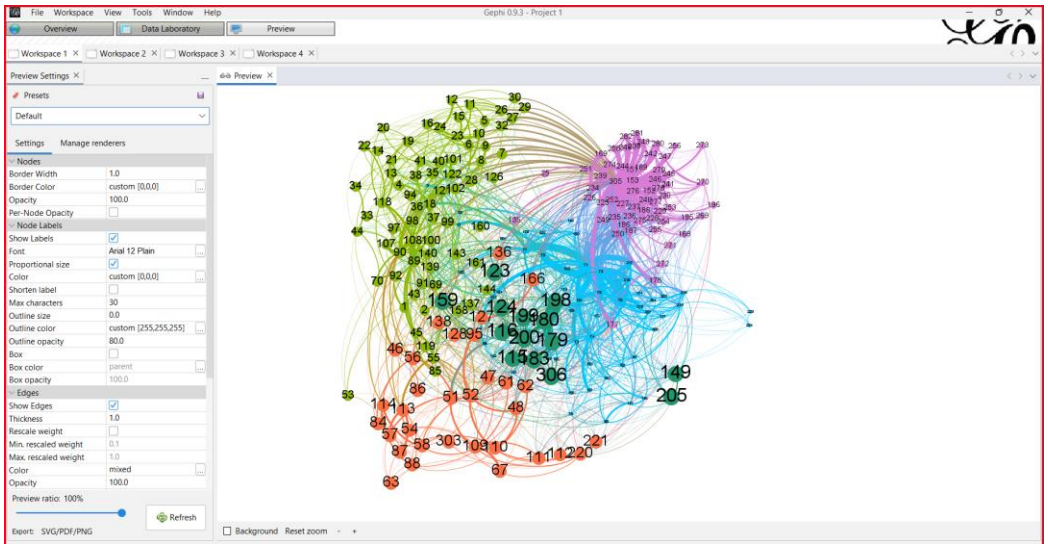
8. From the Filters, we chose Topology folder and dragged the Degree Range Filter to the box below. In the Degree Range Setting, set the lower range to 10, meaning that it hides all nodes with less than 10 connections.



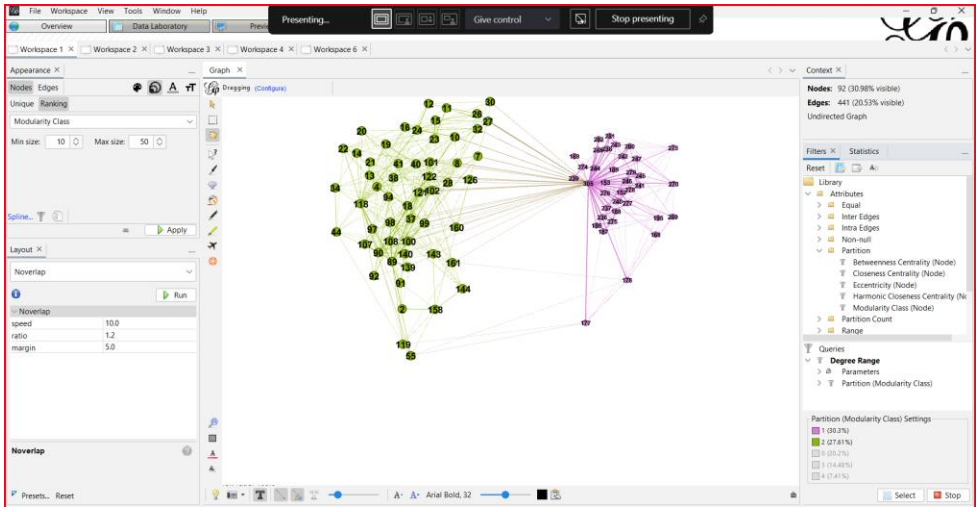
9. Choose Noverlap from the Layout Option. It will make the nodes little separate from each other.



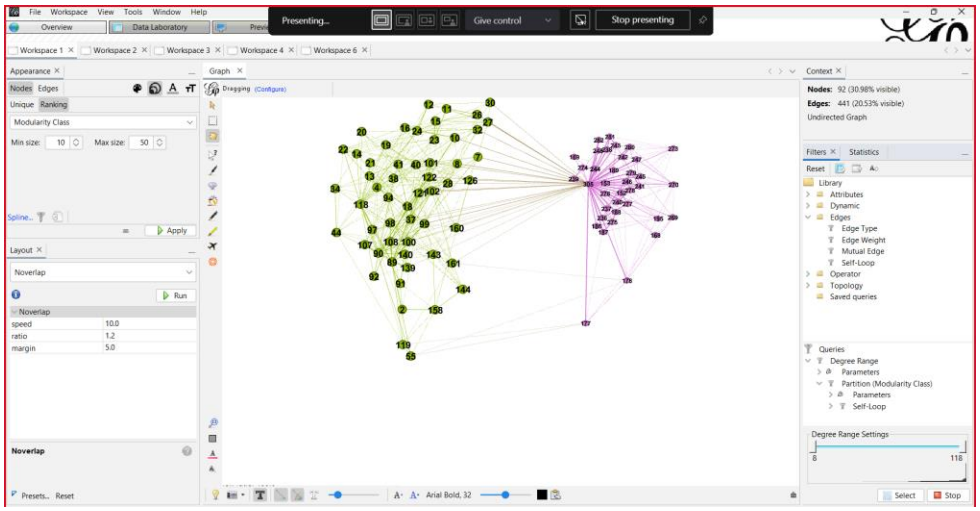
10. Now, click on very top left i.e., the preview tab, under node check the box that says show labels. click refresh at the bottom then set label font under nodes section accordingly. This is used to polish and finalize the look of our visualization.



11. From the Filters, we chose Attribute folder and dragged the Partition Filter to the box below. In the partition Setting, out of 5 boxes only two boxes are checked whose percentage was highest, meaning that it hides all nodes with less percentage.



12. From the Filters, we chose Edges folder and dragged the self-loop Filter to the box below. Its major function is to remove unwanted components of the phase detection or phase comparison frequencies.



13. From the Filters, we chose operator folder and dragged the mask(edges) Filter to the box below. Its major function is to show all characters, relations between characters.