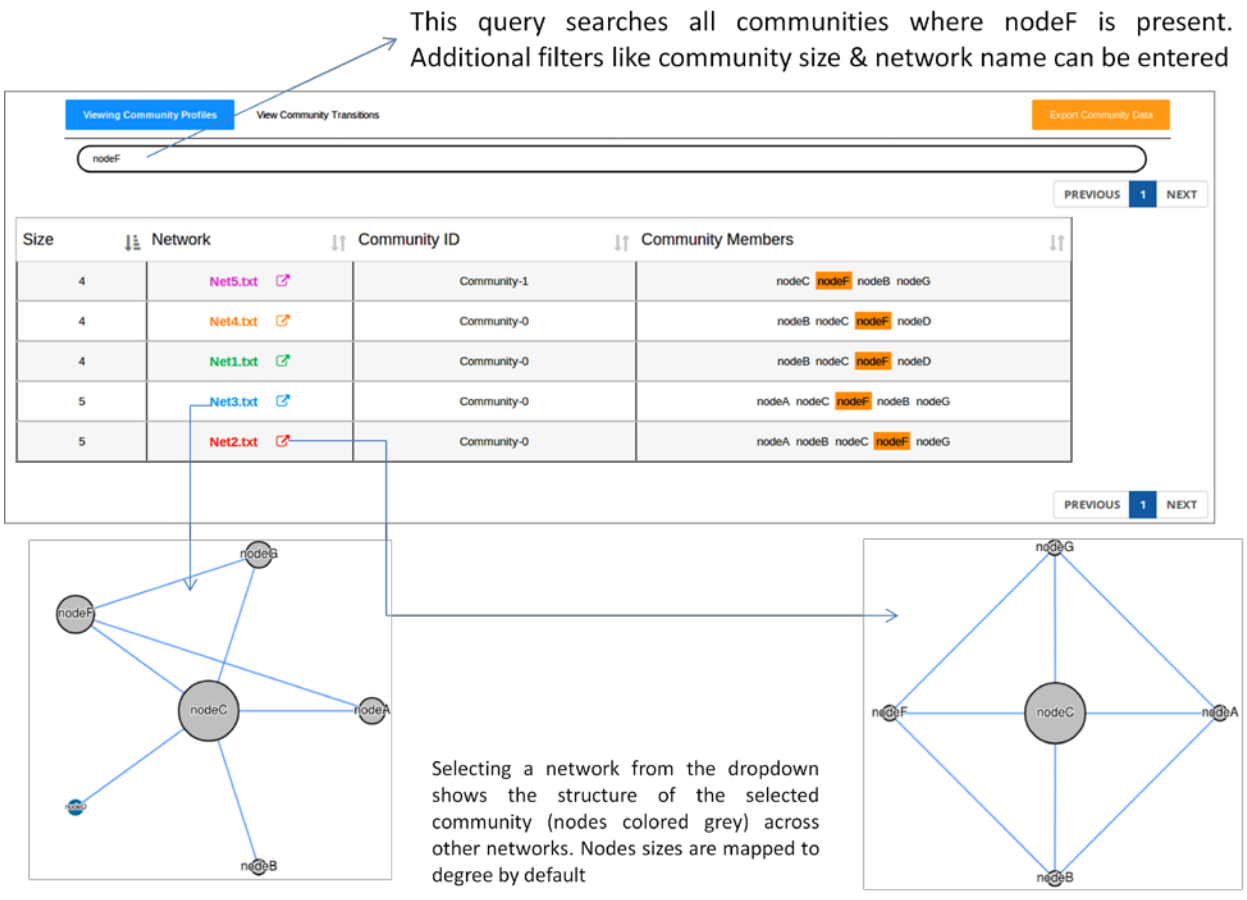
NetConfer Workflow 4

Infer and Compare Community Structures

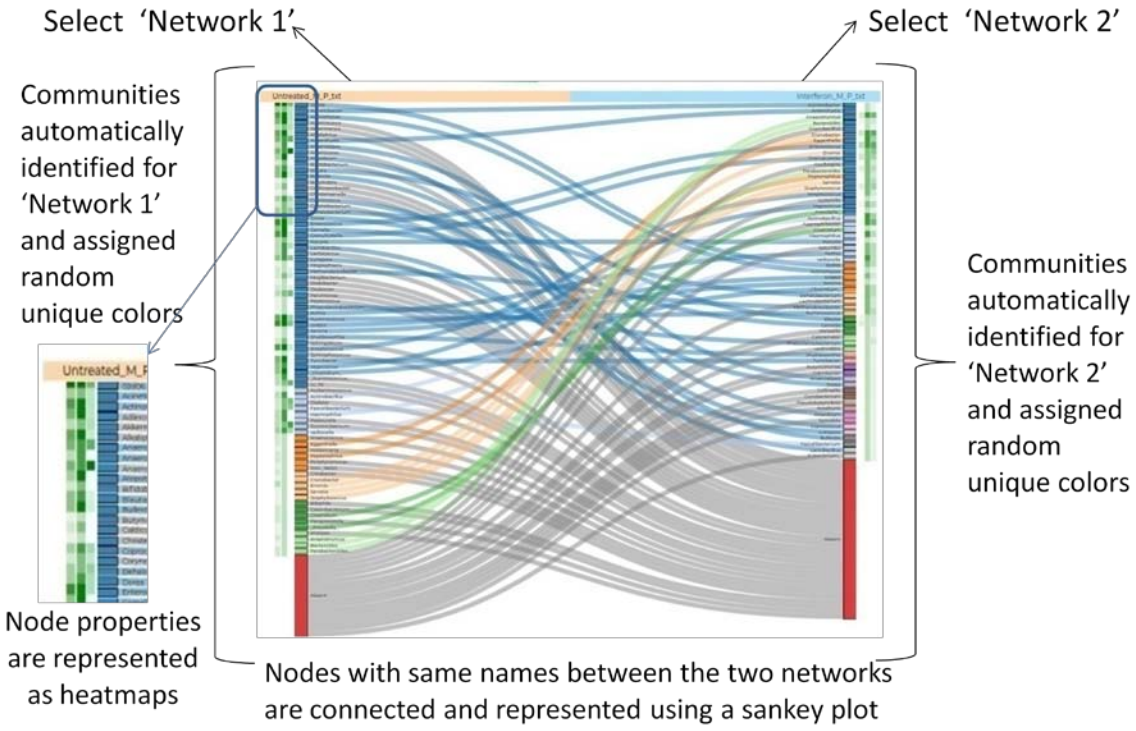
Objective: This workflow is designed to identify and capture changes in community structure (densely connected group of nodes) across the selection. Communities are inferred using Newman and Louvain algorithms. A 'sankey plot' is used to represent changes in communities between a set of selected networks.

Interpretation:

A comparative analysis of the communities identified in the selected networks can be performed using the features available in this workflow. A list of the identified communities (using both Newman and Louvain algorithms) is presented as a searchable tabulated view. In order to view inter network community shuffling, users need to select two networks from the available dropdown and a community comparison is presented as a sankey plot.



NetConfer presents the results in the form of ‘Sankey diagrams’ provide an innovative way of visualizing the results for tracking changes in the community composition(s) between a pair of networks



The above Figure represents an example of a heatmap-embedded Sankey diagram based community transition tracking utility of this workflow. In both the vertical axes, the communities (which are easily distinguishable by colors) along with their constituent member nodes are ordered in the descending order of their size. Using the 'node to node' flow between the two vertical axes, changes in communities’ constituent can be tracked easily, thereby helping users in identifying not only communities which are conserved across networks, but also the ones which undergo reshuffling. Heatmap embedded besides the nodes represents the three important centrality measures i.e. Degree, Hub-score and Betweenness (whose values have been rank normalized across the given pair of network). This heatmap allows for easy identification of key nodes and tracking their fate in communities of the two networks being compared. Additionally, a tabulated summary of the ‘community shuffling’ (with an intersection and Jaccard score of community similarity) is presented along with the sum Jaccard and weighted sum Jaccard score for user convenience.