

Problem

Cytoscape is a popular software for working with data and displaying networks. Sometimes, users need to identify bipartite and clique subgraphs within their network in order to draw meaningful conclusions from their data.

The problem is that Cytoscape does not have a feature that can do that by default. Therefore, there is a need for a plugin that can do that while also making the subgraphs easy to visualize.

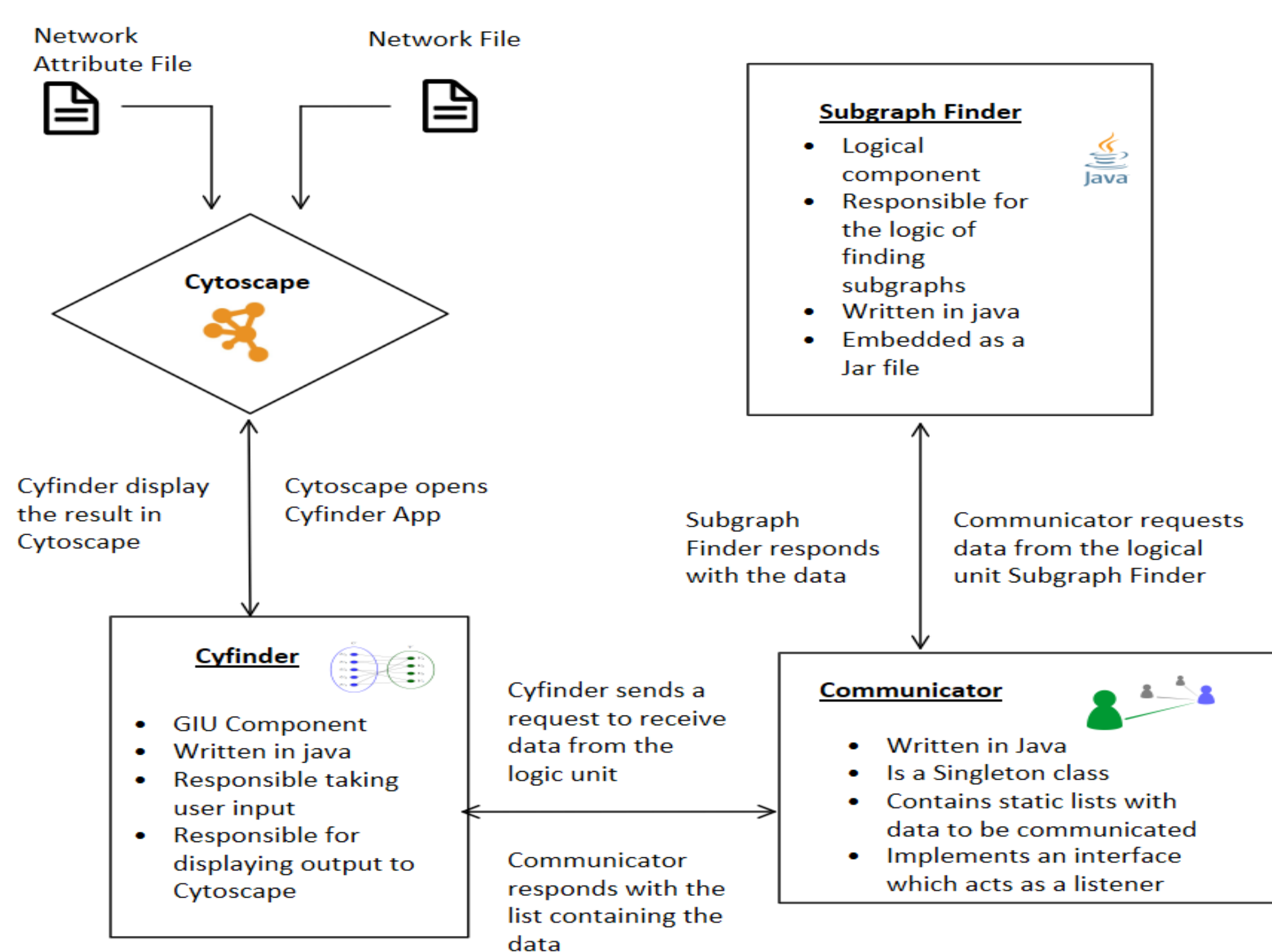
Current System

Currently, networks need to be in an undirected state to be processed. The current system provides 2 ways of doing this, the additive method and the transformative method. The type of subgraph to be search for is then specified, bipartite or clique. One of two algorithm is then provided for the user to choose from, breadth first search or depth first search. Then, a way of saving the result is specified.

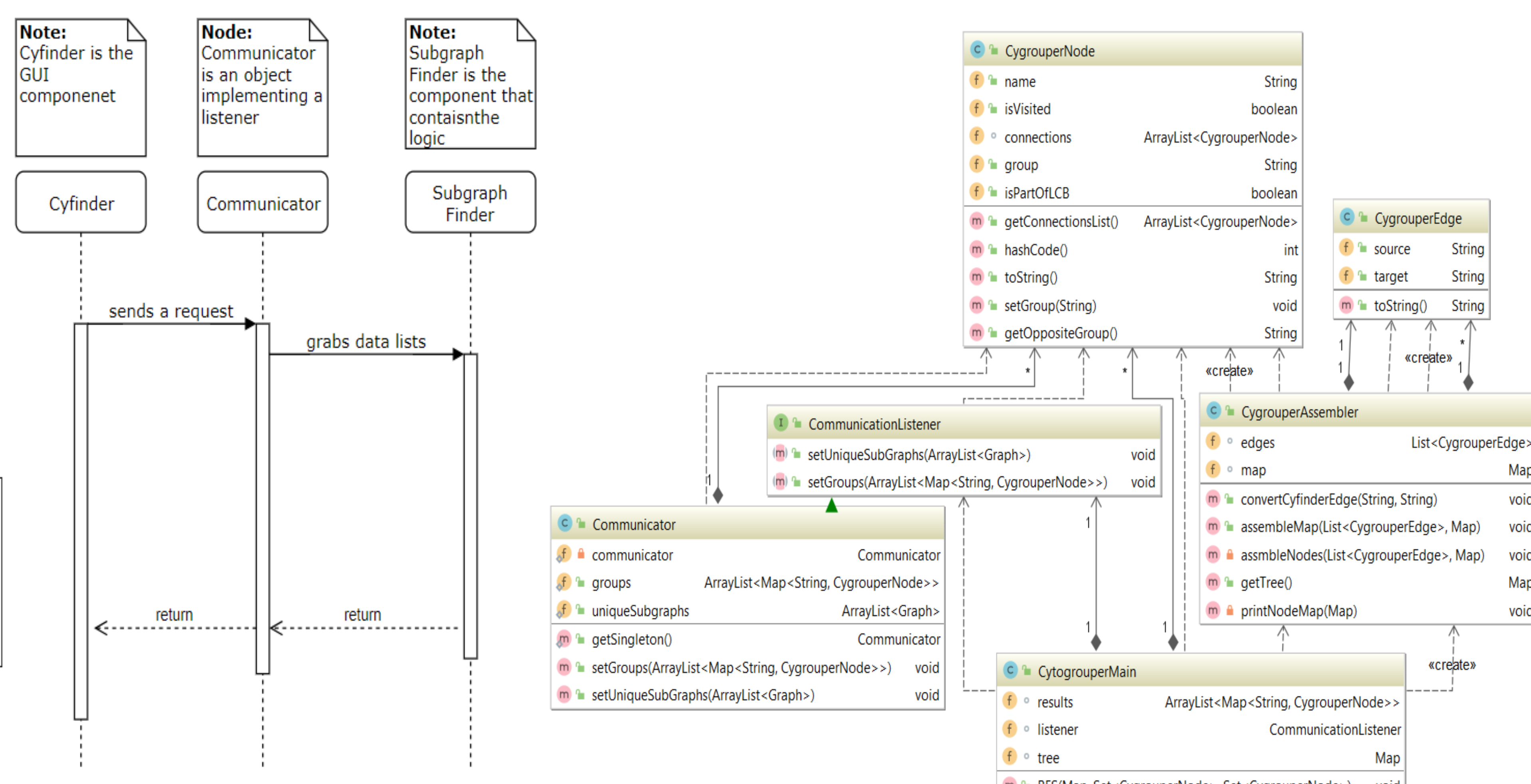
My Contribution

- I Implemented a component that is responsible for communication between the subgraph finder module and the CyFinder plugin.
- I Contributed to the GUI of CyFinder by providing more functionality to the display of subgraphs
- I Implemented a component which processes and manages data provided from Cytoscape

System Design

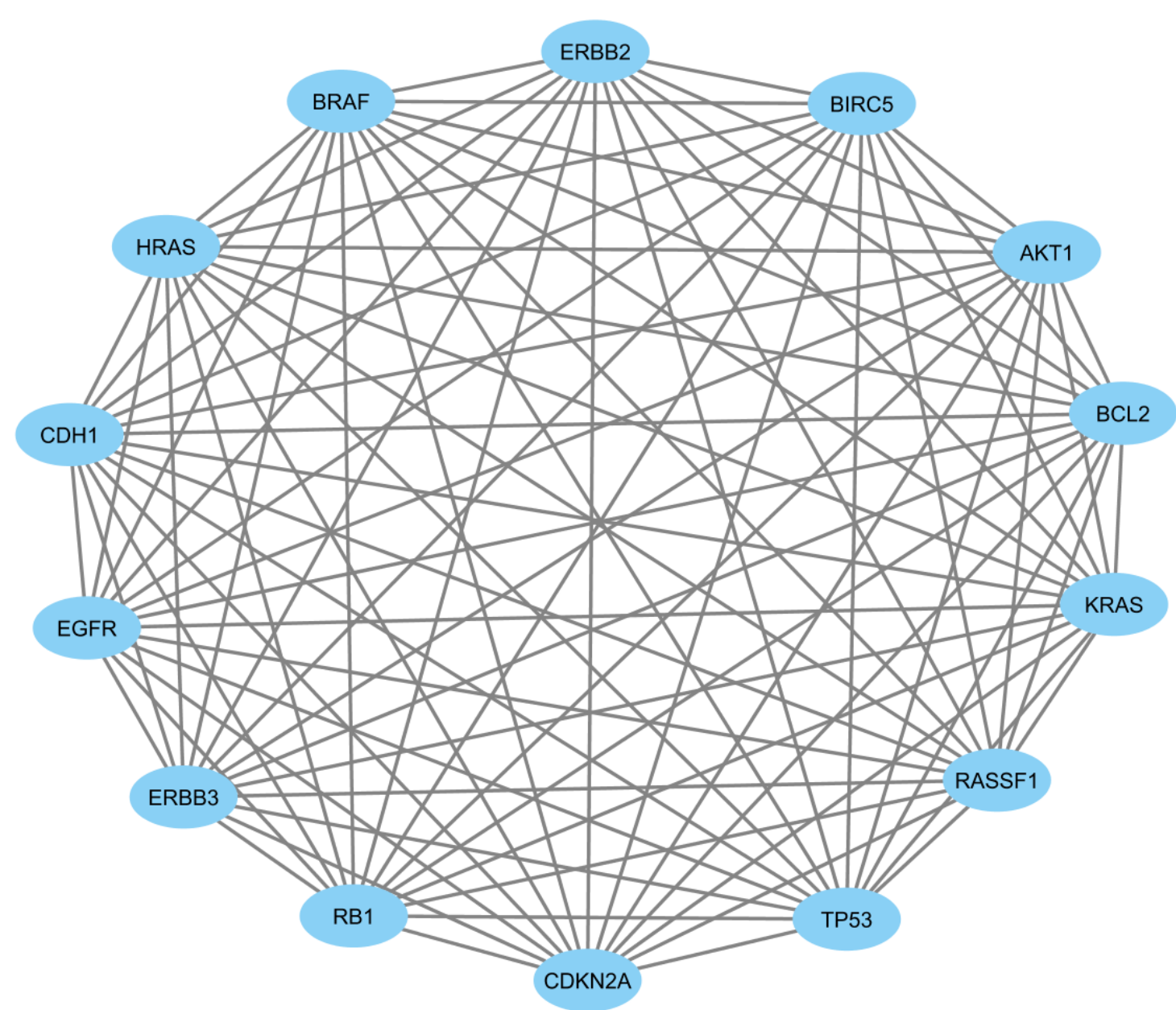


Object Design

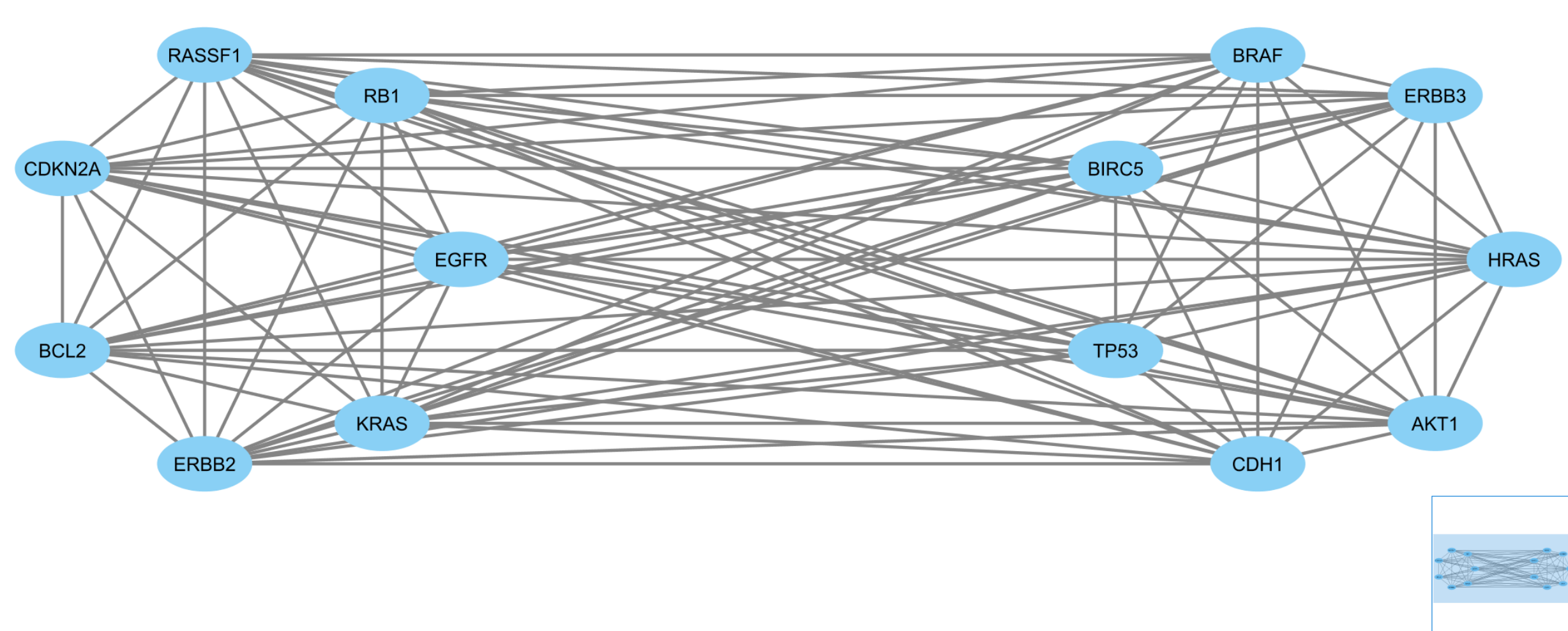


Screenshots

Subgraph before:



Subgraph after applying the clique grouping feature:



Summary

After working on CyFinder for the last three months:
CyFinder can divide the bipartite subgraph's nodes into two groups based on which set they belong to.
The groups can also be displayed and visualized in an effective way which makes it easier for a user to work with the subgraph network.
The Subgraph Finder module and the CyFinder module are integrated correctly into Cytoscape.
Plenty of important documentation about the configuration, environment, and logic of the CyFinder app have been created to aid the next group of contributors.

Requirements

- Hardware:
 - Windows Machine / Mac
- Software:
 - Cytoscape Version 3.7.2
 - Java 8
 - Maven
 - Ant Builder
- Cytoscape Libraries:
 - org.cytoscape:service-api:3.2.0
 - org.cytoscape:swing-application-api:3.1.0
 - org.cytoscape:core-task-api:3.2.0

Verification

Manual testing was done throughout the development of all the features due to the way Cytoscape works.



Acknowledgement

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