Social Network Analysis

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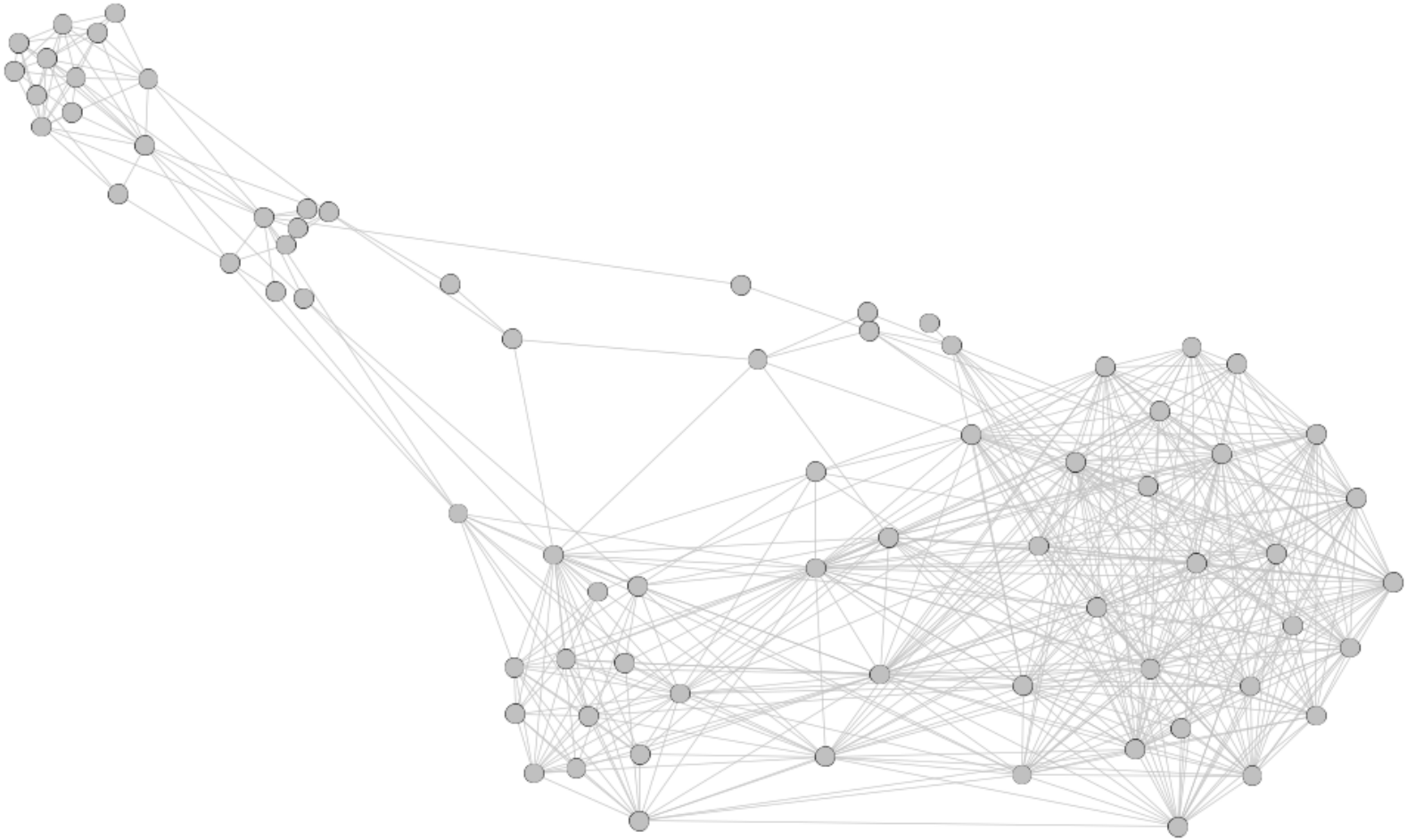
Network information

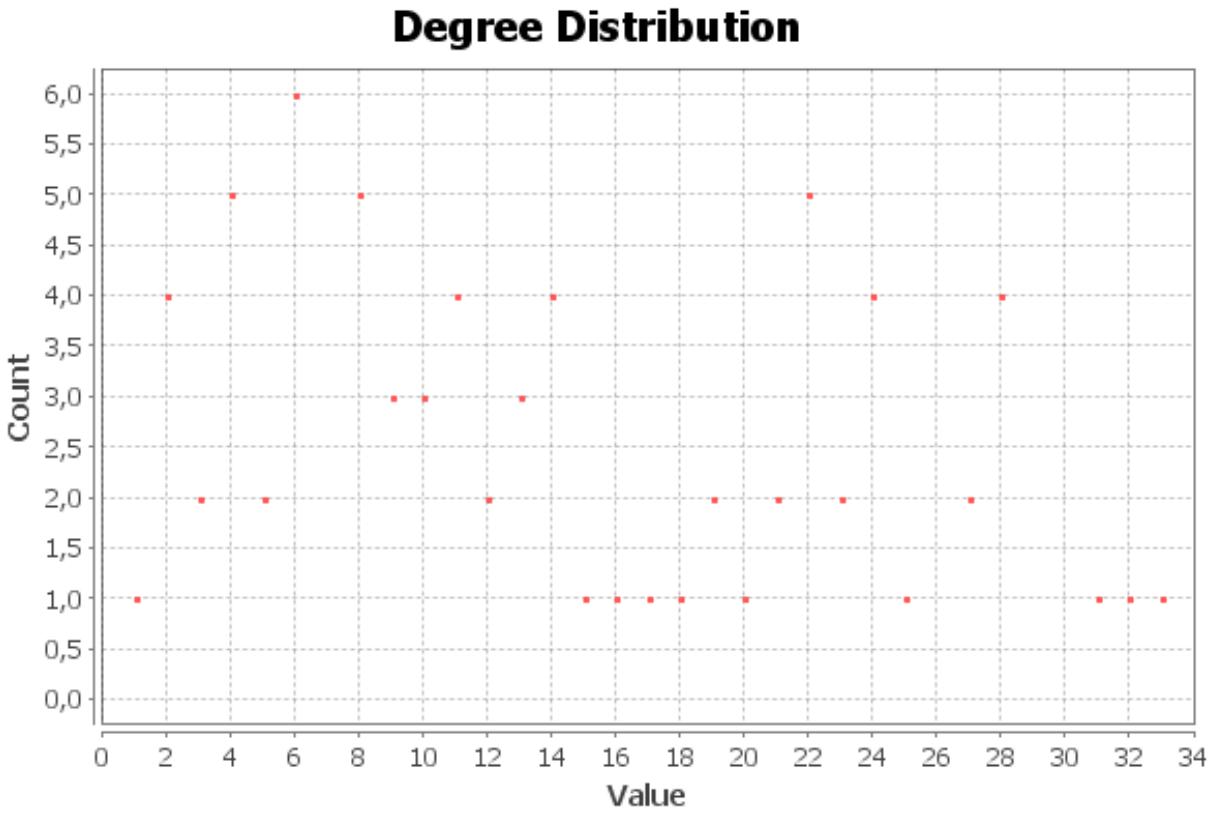
- The network is the graph of friends taken from vk.com by means of API.
- Number of nodes: 74
  Number of edges: 523
- Following node attributes were added: **city** and **university**

Basically, everything I couldn't compute using Gephi, I obtained with networkx and python generally, set node/edge attributes and saved as .gexf file

Network Layout



Network Characteristics

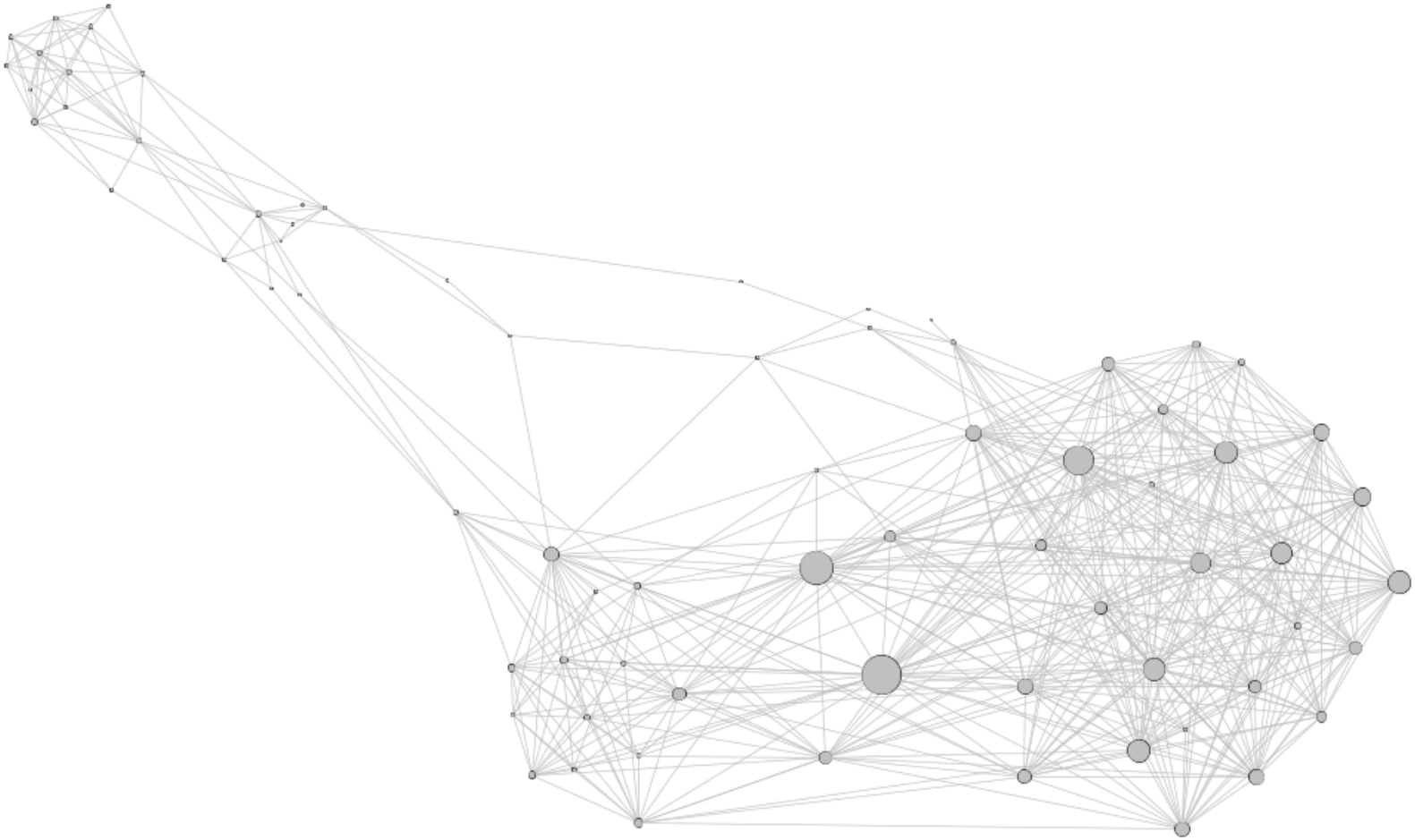


Average Degree: 14.135

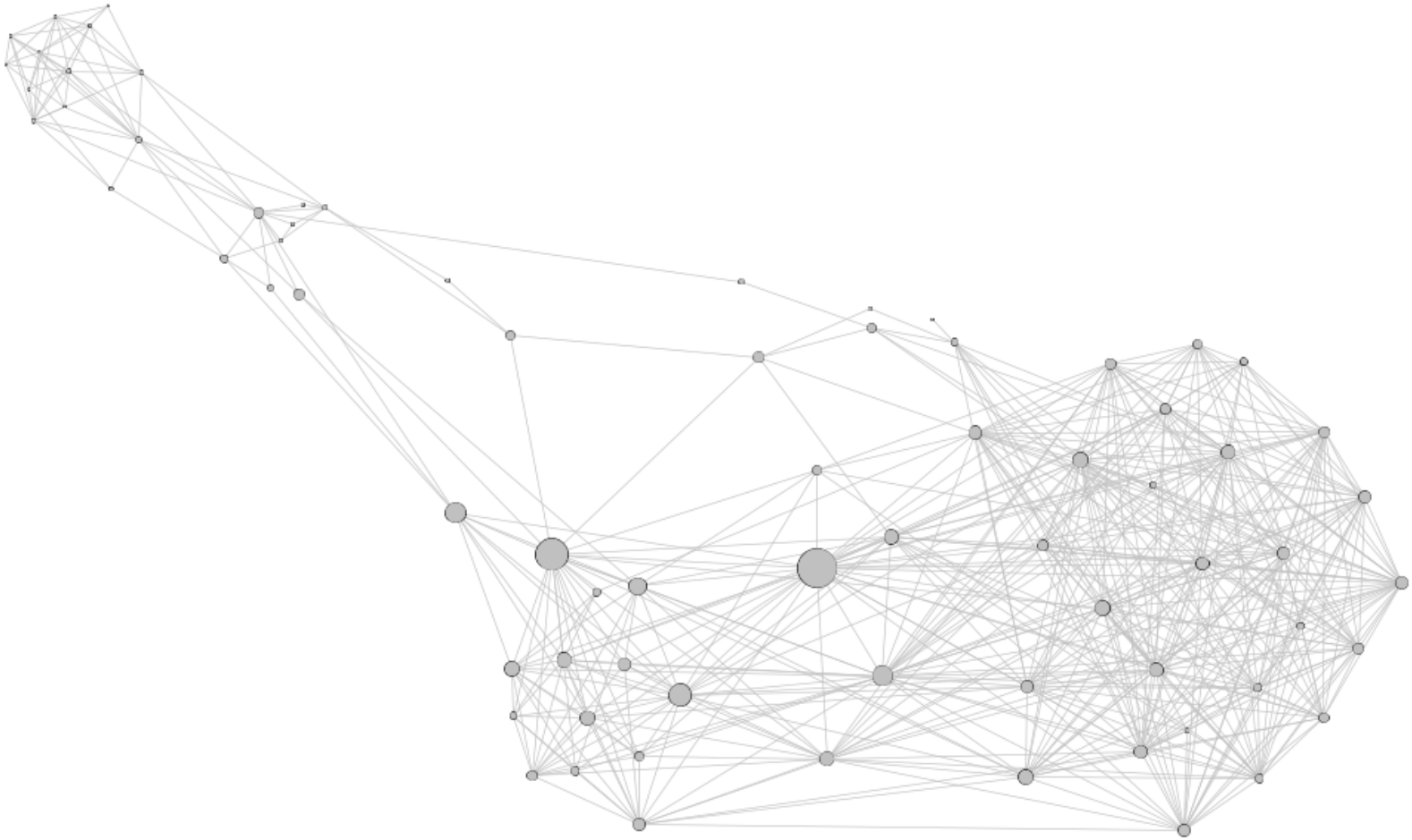
Diameter: 6

Average Clustering Coefficient: 0,645

Degree Centrality

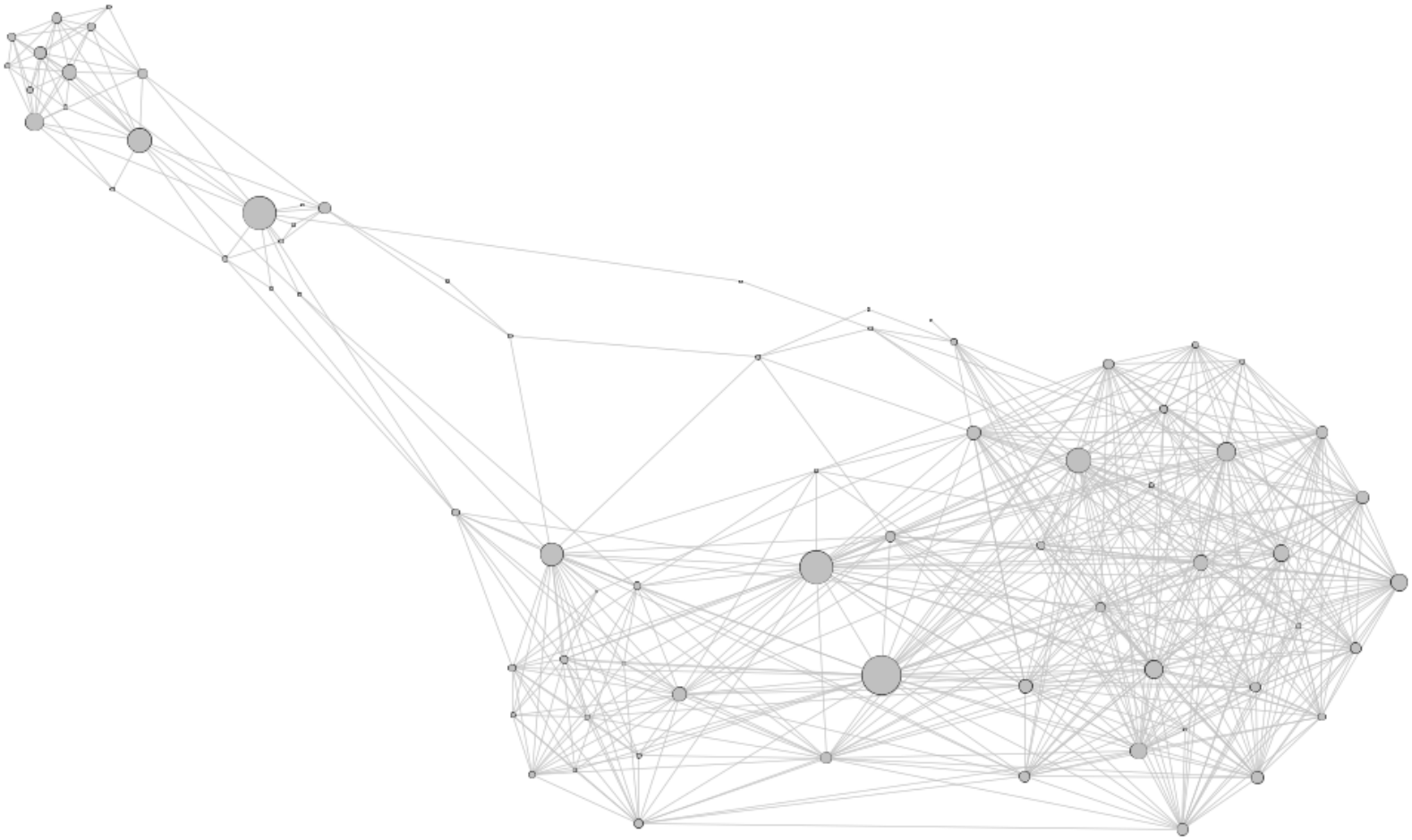


Closeness Centrality



Betweenness Centrality

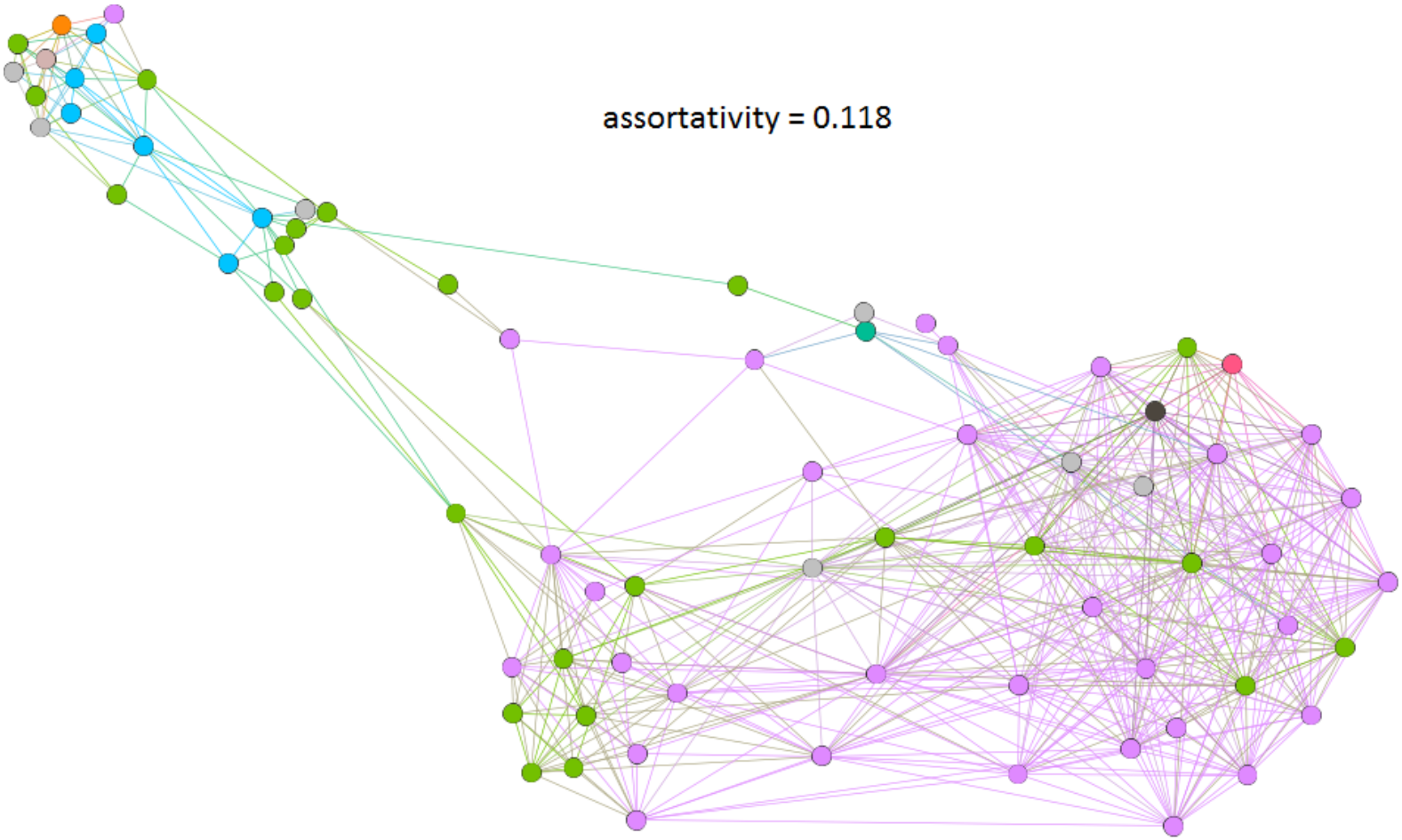
PageRank



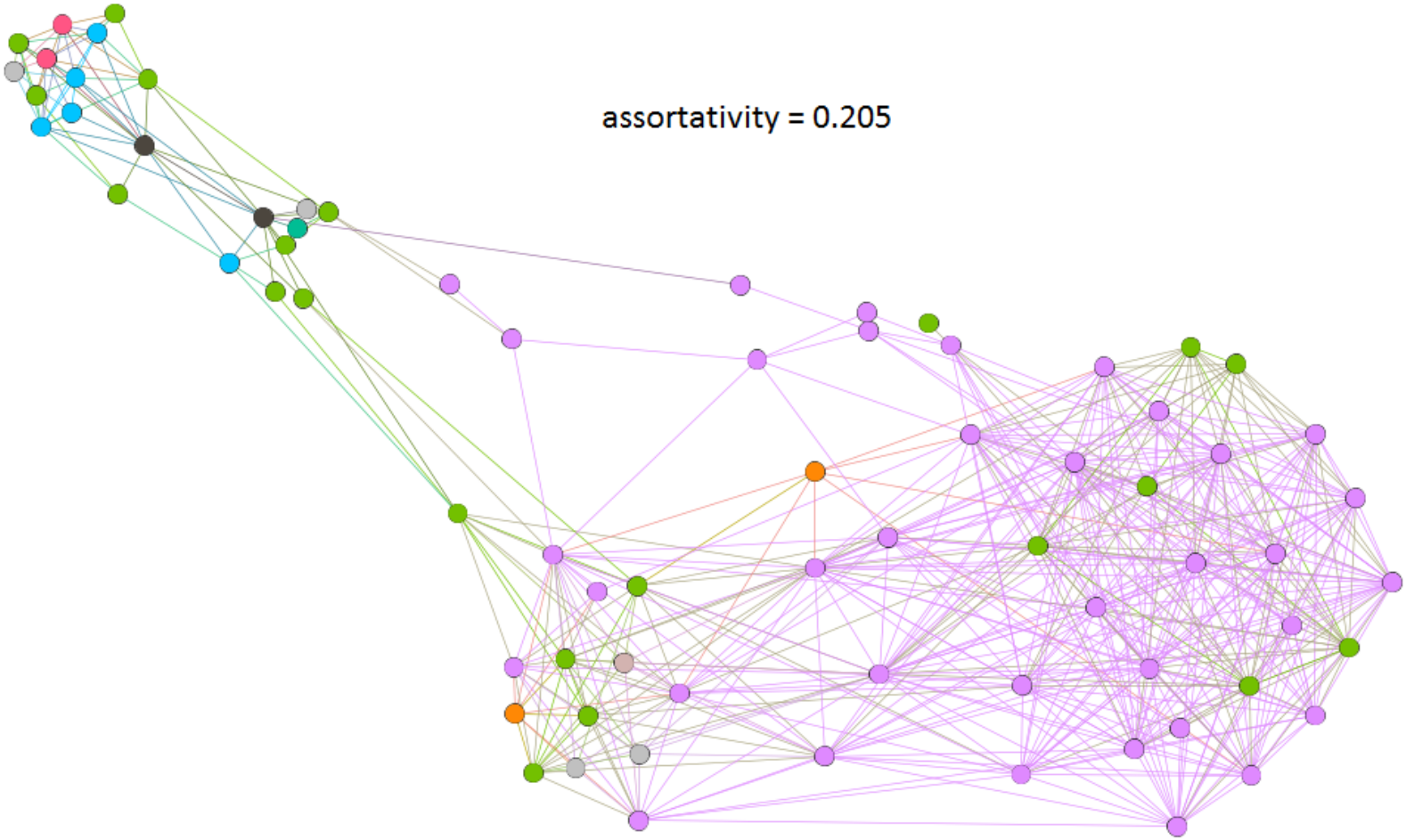
Interpretation

High degree centrality have people I have the most value of common friends.
High closeness centrality have nodes which connect these two big clusters. In particular, people, who my former coursemates and today coursemates.
Highest betweenness have nodes between my HSE and non-HSE mates, because there are only few of them.
PageRank shows some kind of combination of these centralities.

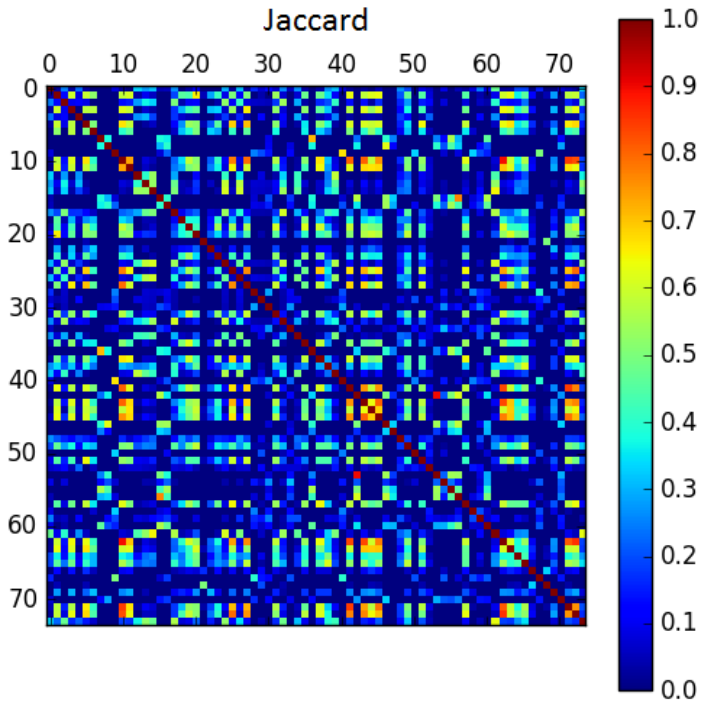
Assortative Mixing: City

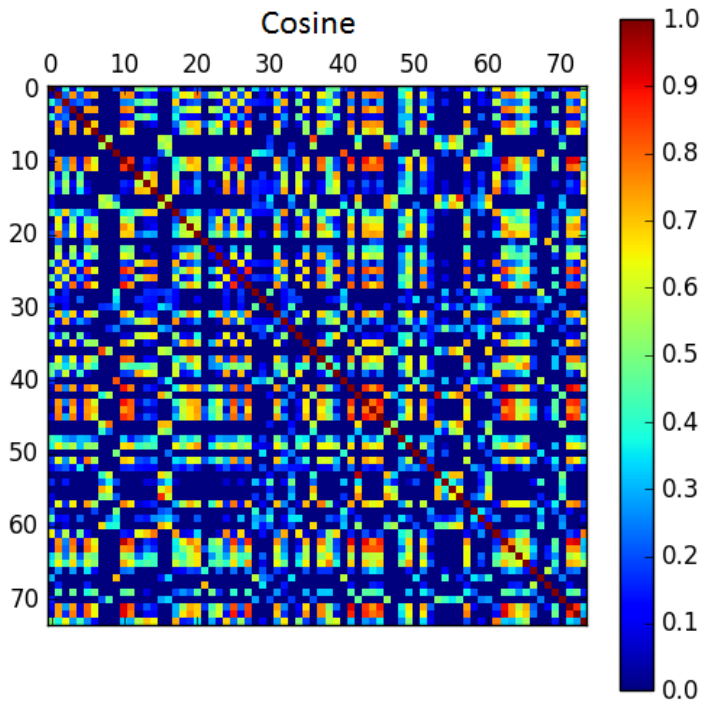


Assortative Mixing: University

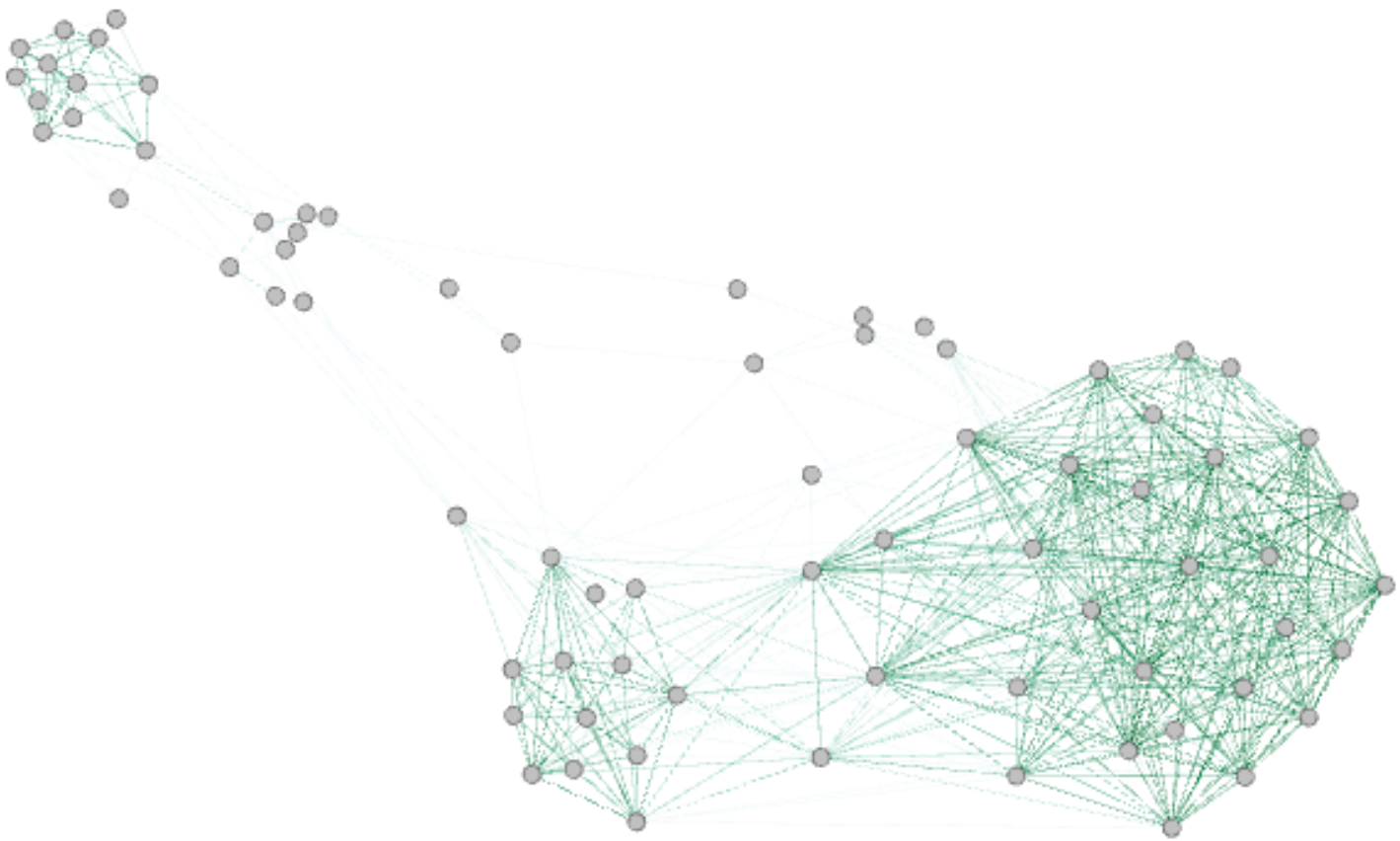


Structural Similarity: Jaccard and Cosine





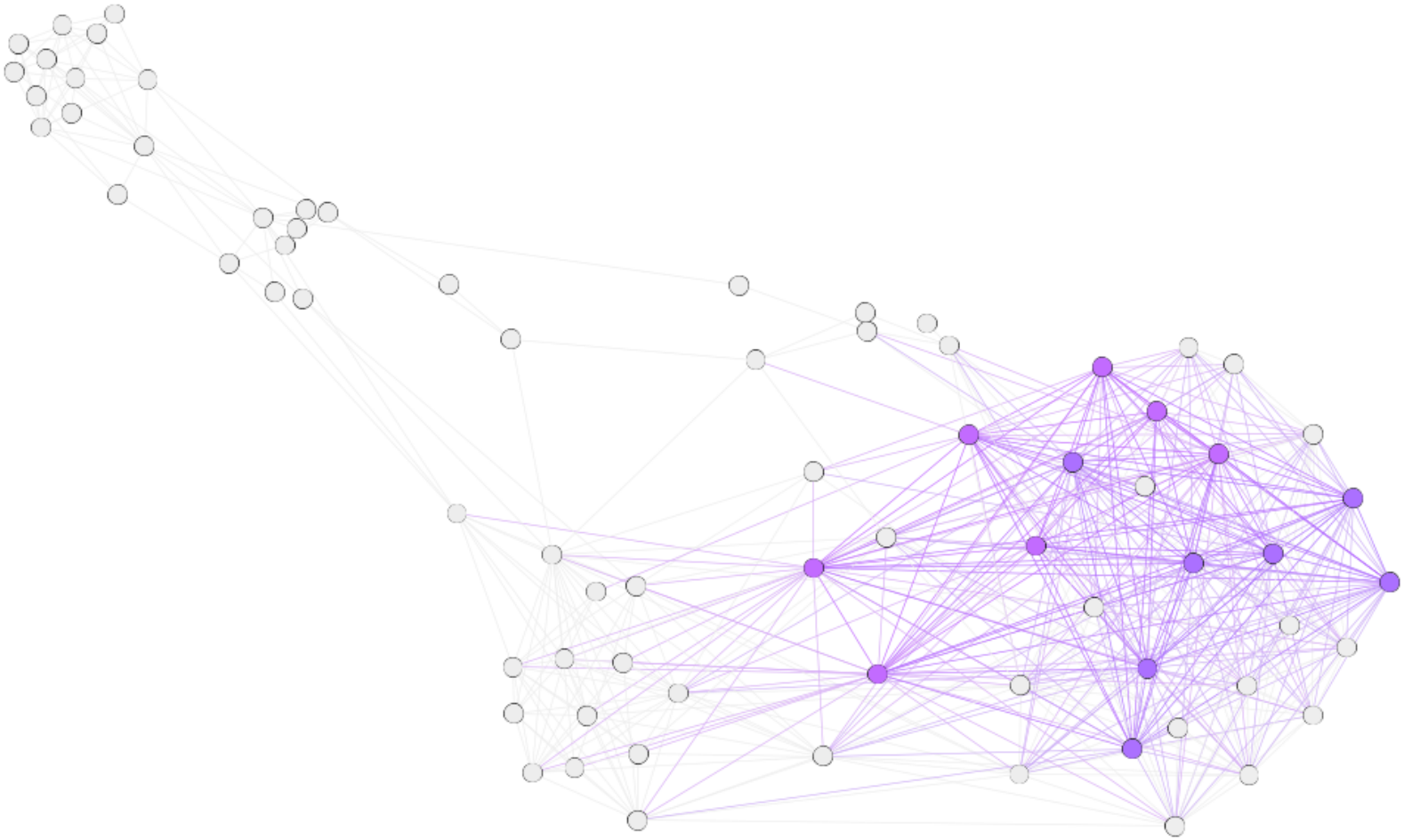
Structural Similarity: Cosine



To illustrate the similarity I set the weights of the nodes to corresponding the cosine values.

Community Detection: Cliques

There are 142 maximal cliques. And 8 largest containing 14 nodes. Two largest cliques with maximal symmetric difference:



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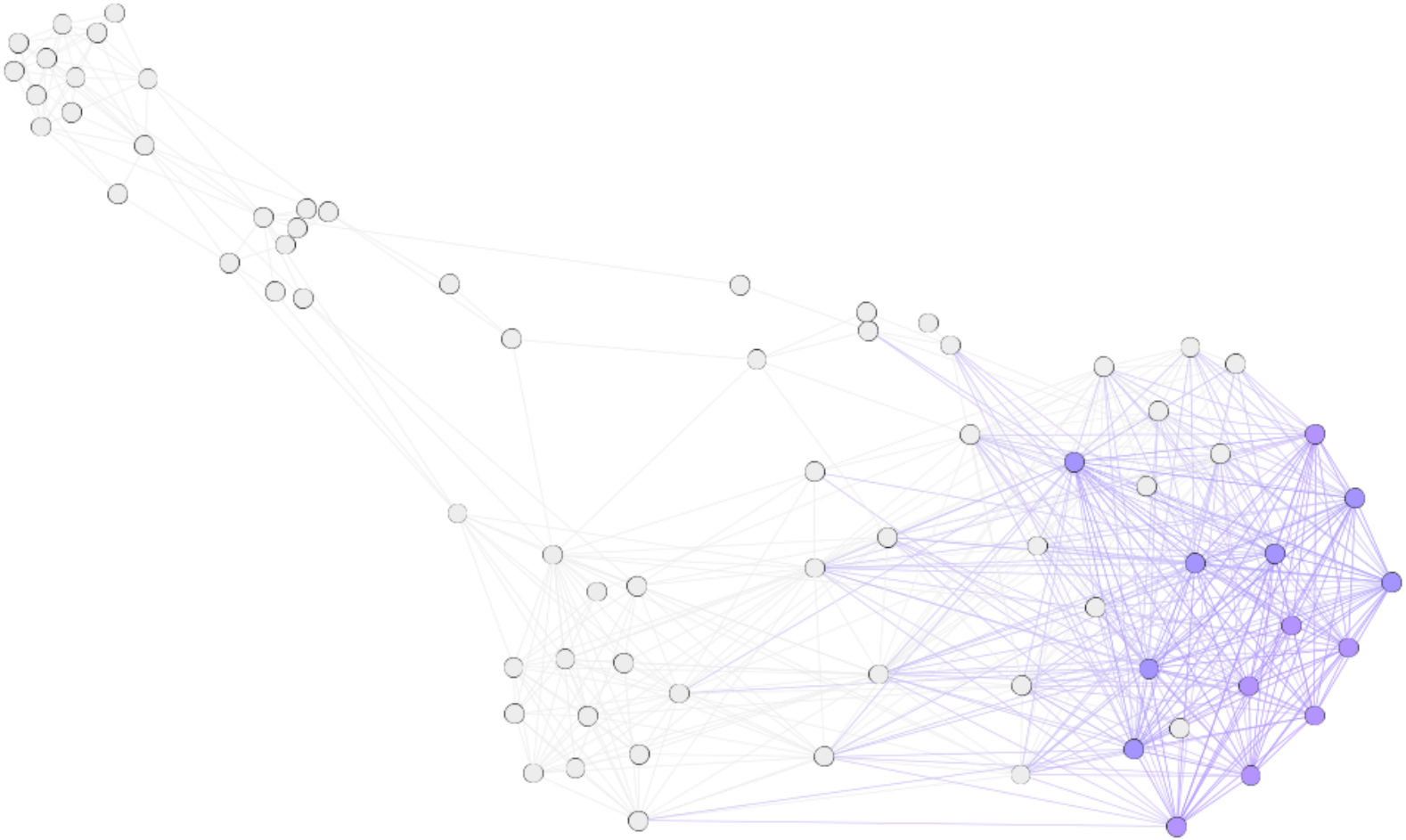
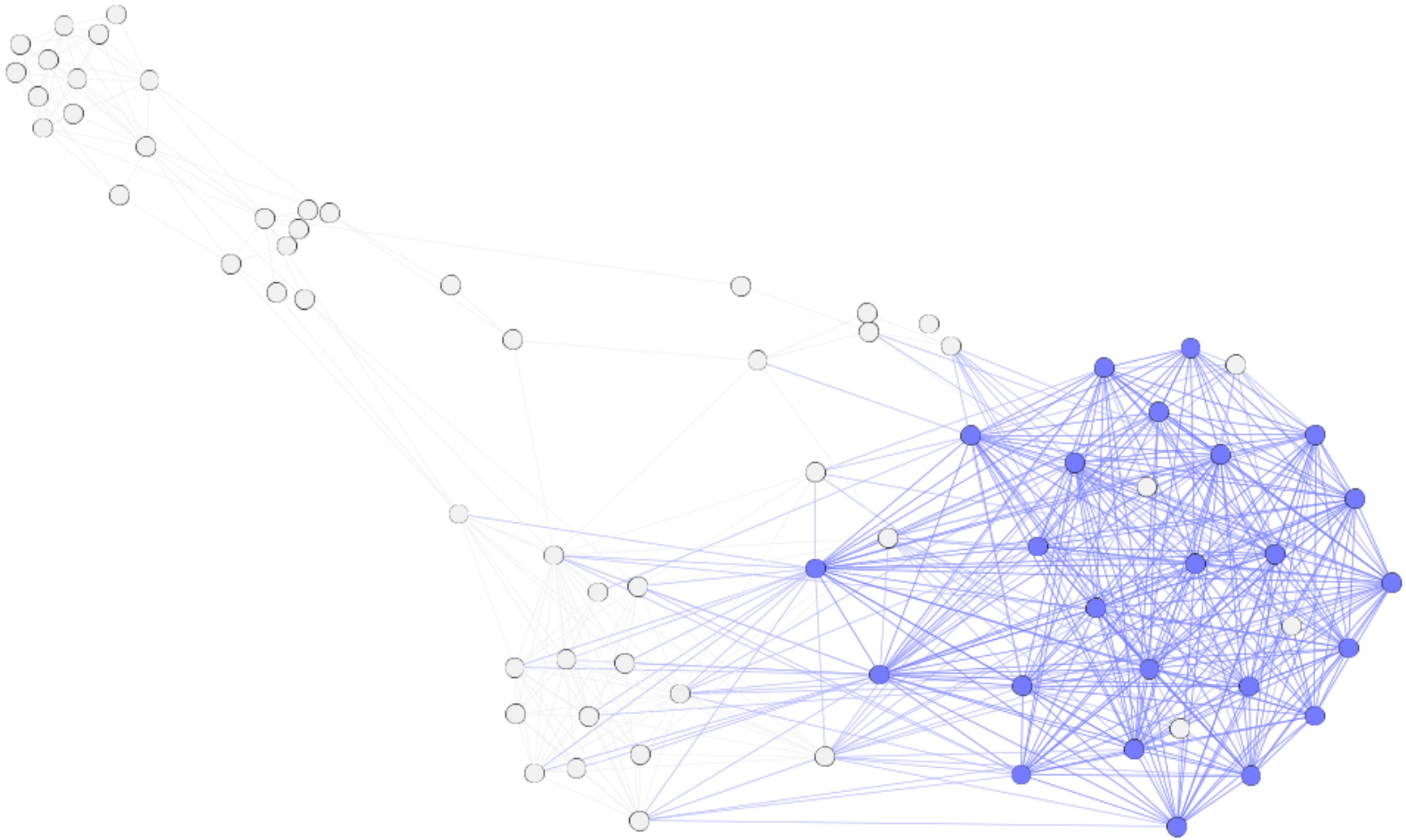
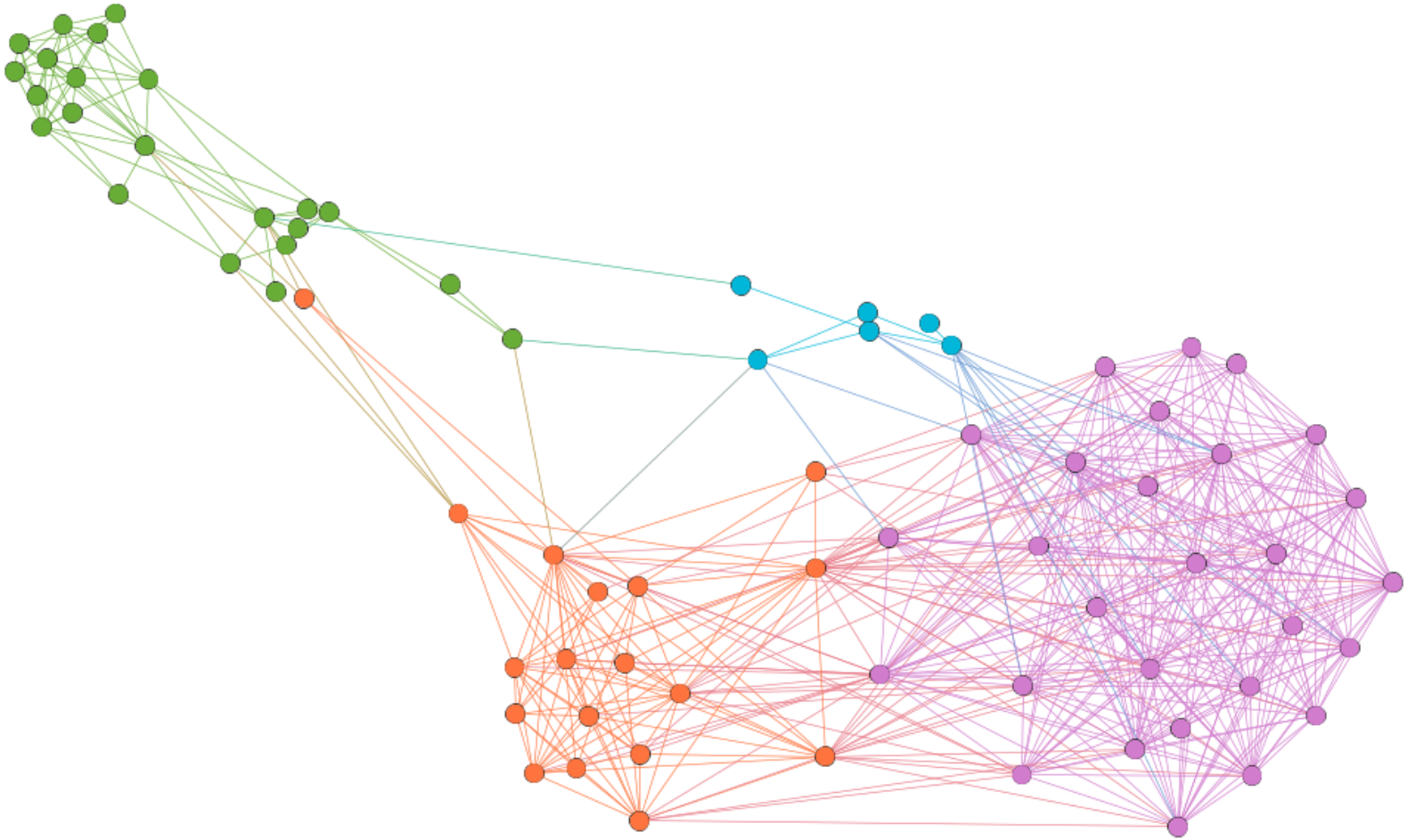


Community Detection: Main Core



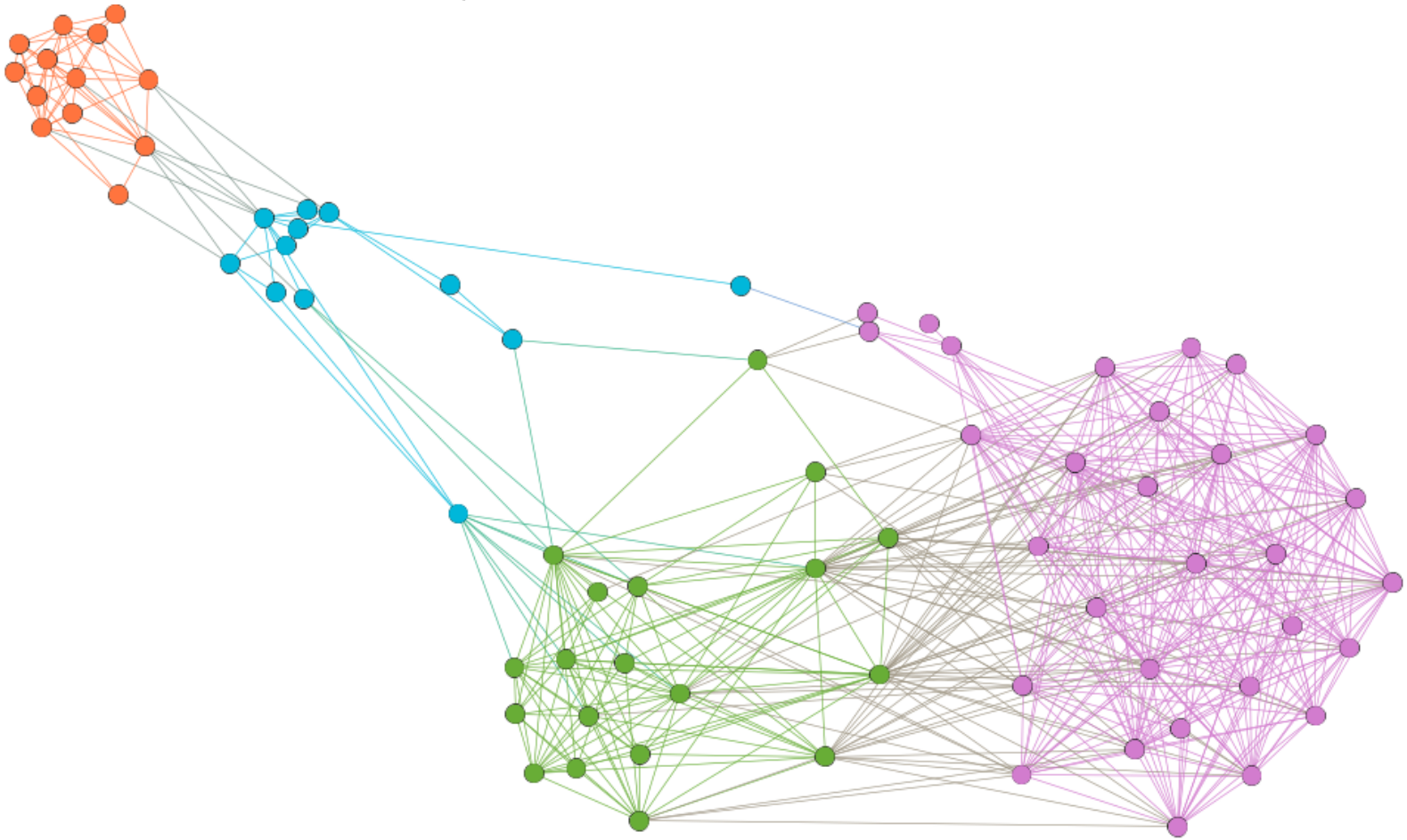
Community Detection: Louvain Algorithm

4 clusters, modularity: 0.406



Community Detection: Recursive Spectral Partitioning

4 clusters, modularity: 0.392



Community Detection: Results

Both methods showed decent partitioning with a quite high modularity. Both highlighted the main clusters: Hometown, Coursemates, Former Coursemates and some of other HSE connections. The borders between clusters are kind of blurry due to the fact, that even I can't define unambiguously some persons which cluster they belong to.

Thank you!