NATIONAL RESEARCH
UNIVERSITY

Network Science. VK Project

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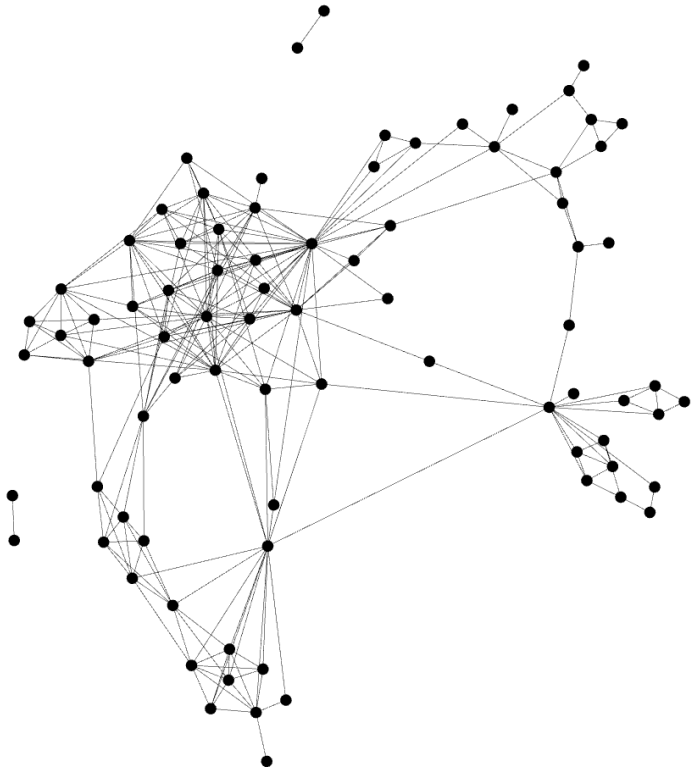
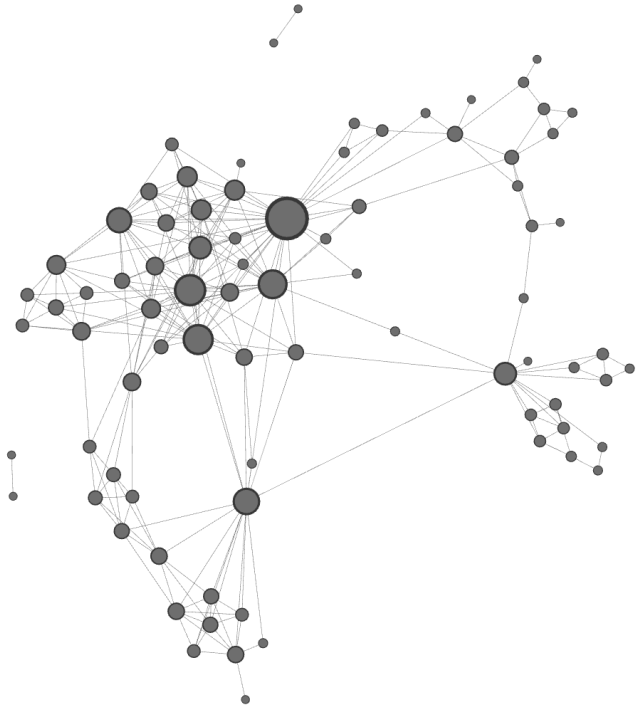
Network summary

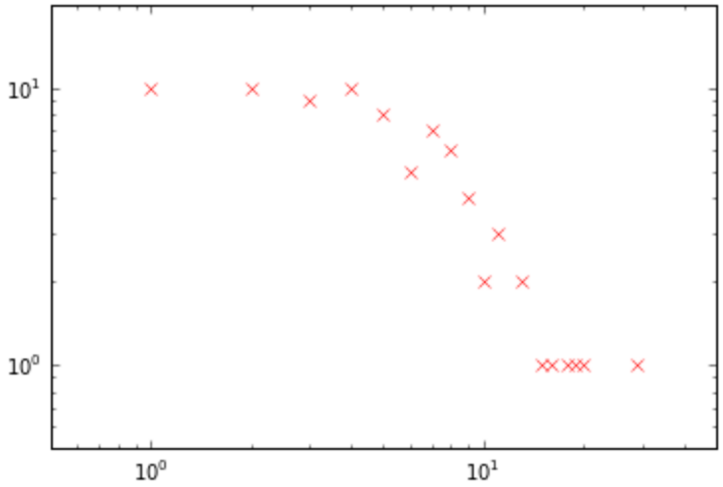


- Attributes: *city, country, name, sex*
- Number of nodes — 82, number of edges — 284

Network summary

Degree distribution

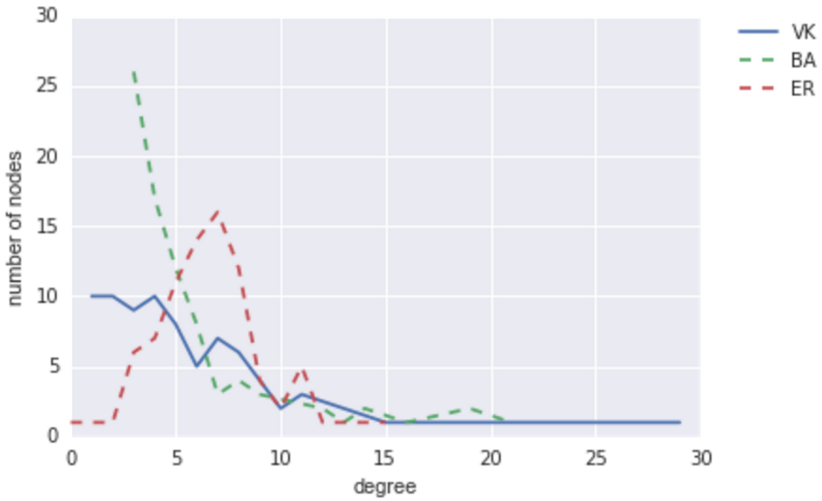


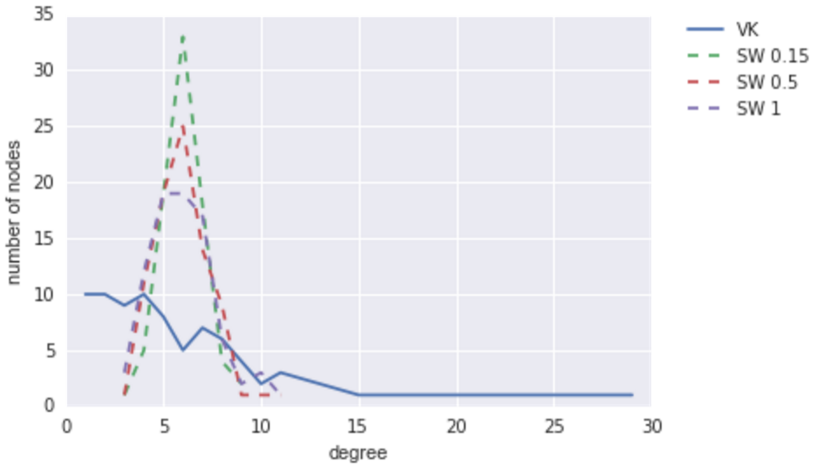


- min degree — 1, max degree — 29
- Clustering coefficient: 0.51

Structural analysis

Closest random graph



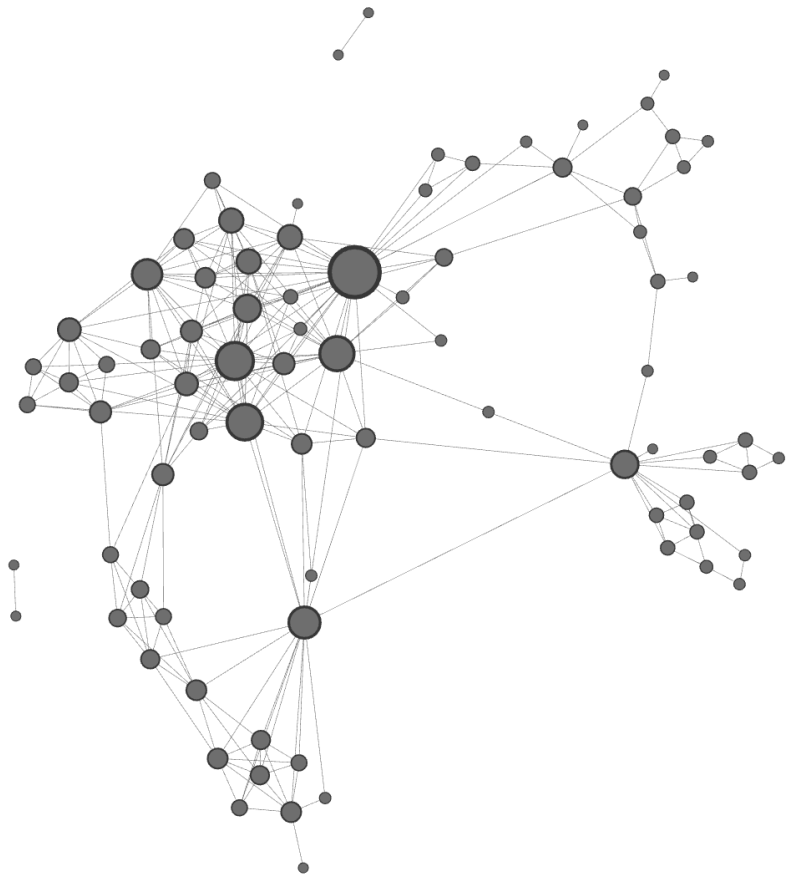


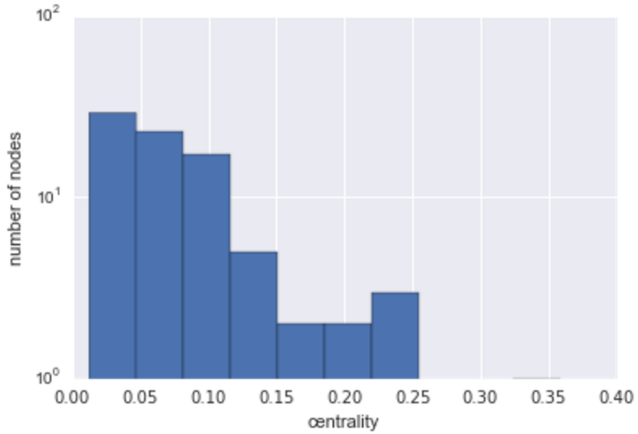
- Barabasi-Albert model ($n = 82, m = 3$)
- Erdos-Renyi model ($n = 82, p = 0.075$)
- Small World model ($n = 82, k = 6, p = 0.15, 0.5, 1$)

** in all model number of edges* $\approx 250 - 300$

Structural analysis

Degree centrality



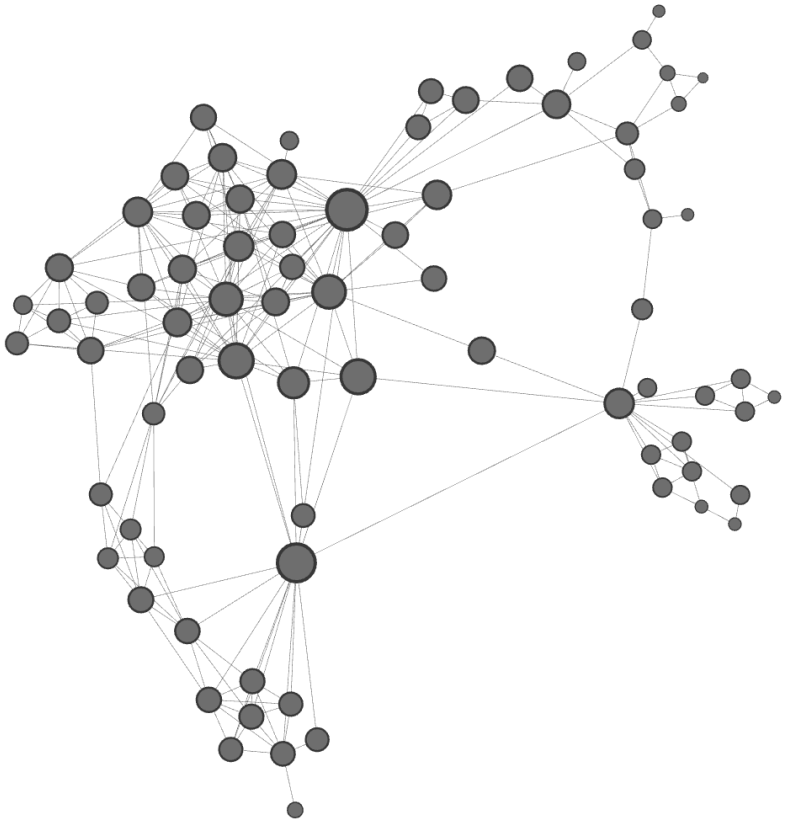


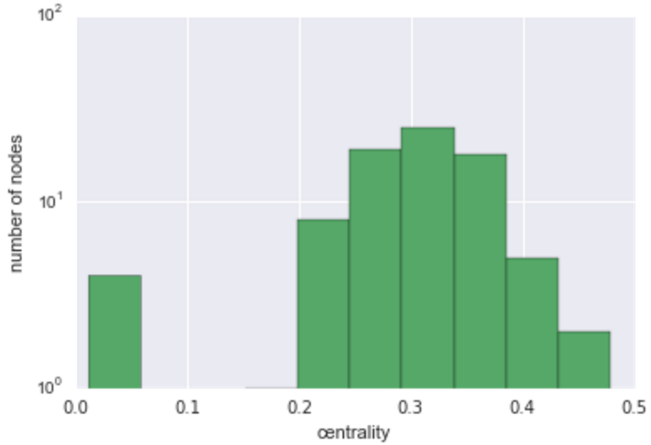
TOP 5

Dmitrij Galkin	0.358
Ashot Eljazjan	0.246
Maks Vorob'ev	0.235
Ksenija Shnel'	0.222
Marina Volosnikova	0.198

Structural analysis

Closeness centrality





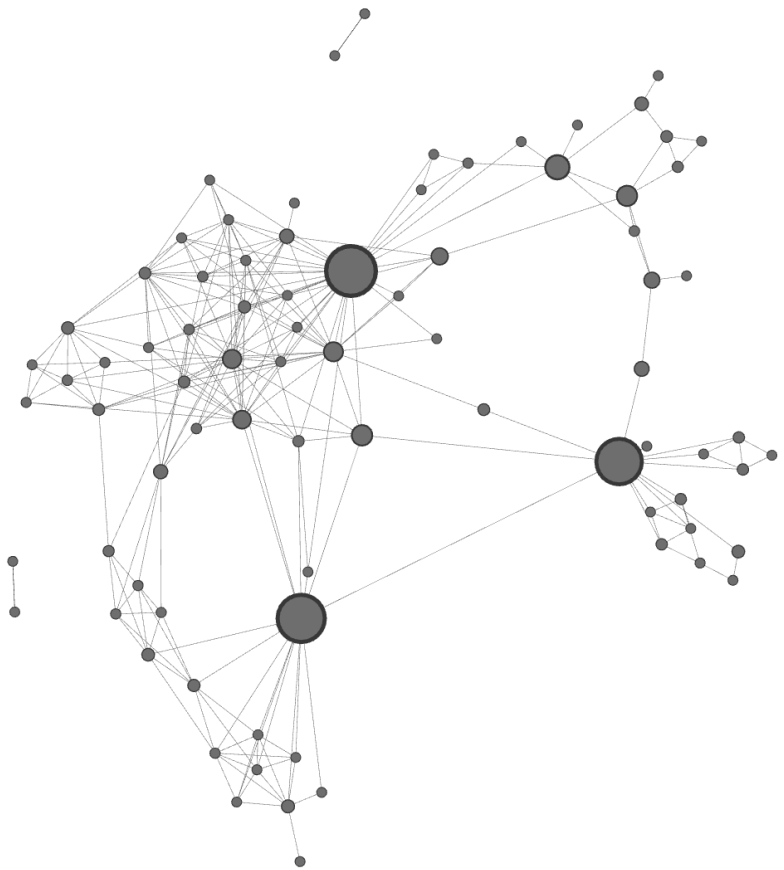
TOP 5

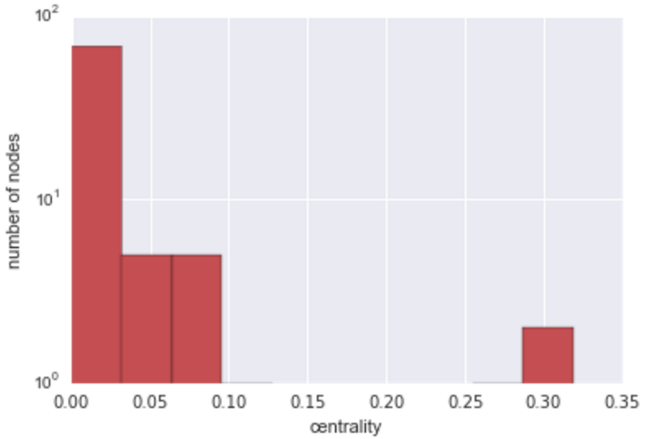
Dmitrij Galkin	0.478
Marina Volosnikova	0.455
Natal'ja Iljushechkina	0.421
Maks Vorob'ev	0.421
Ksenija Shnel'	0.409

** at this part we consider only the largest connected component*

Structural analysis

Betweeness centrality



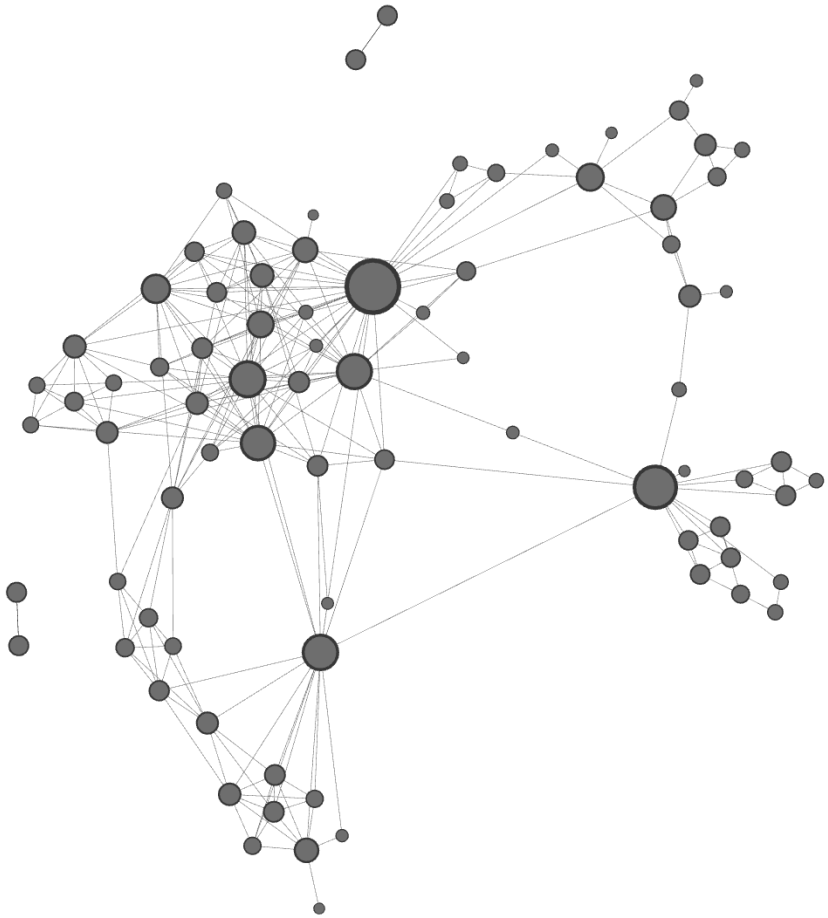


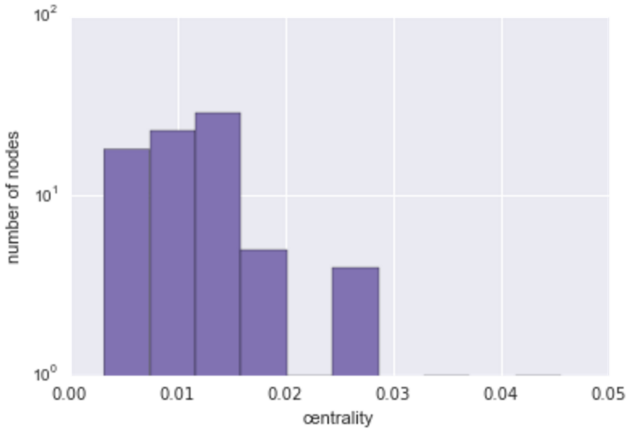
TOP 5

Dmitrij Galkin	0.318
Marina Volosnikova	0.298
Viktorija Ishimtseva	0.285
Maks Matuzenko	0.114
Natal'ja Iljushechkina	0.085

Structural analysis

PageRank



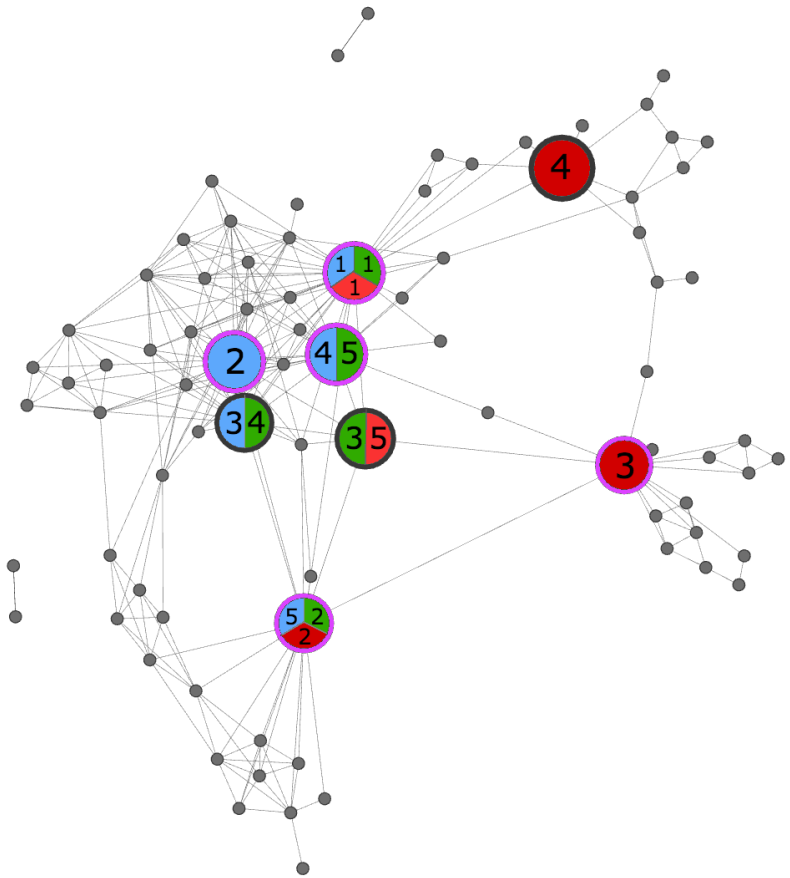


TOP 5

Dmitrij Galkin	0.046
Viktorija Ishimtseva	0.035
Ashot Eljazjan	0.028
Marina Volosnikova	0.028
Ksenija Shnel'	0.027

Structural analysis

Comparison



Correlation coefficient

	D	C	B	PR
D	1.	0.67	0.64	-0.04
C	0.67	1.	0.42	-0.03
B	0.64	0.42	1.	-0.08
PR	-0.04	-0.03	-0.08	1.

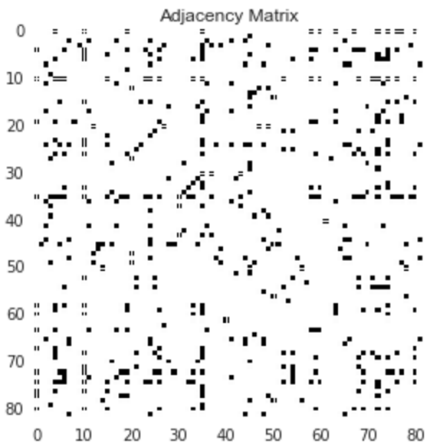
Spearman correlation

	D	C	B	PR
D	1.	0.8	0.67	0.05
C	0.8	1.	0.53	0.08
B	0.67	0.53	1.	0.02
PR	0.05	0.08	0.02	1.

Structural analysis

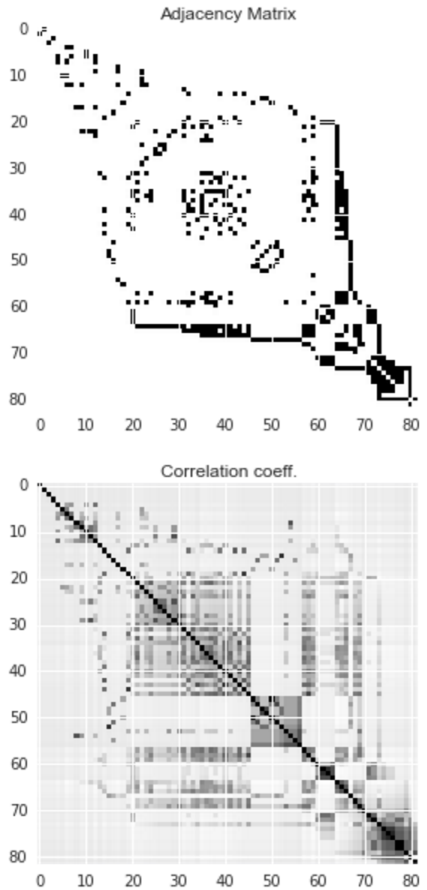
Assortativity & Similarity

Attribute	degree	city	country	sex
Assortativity	0.014	0.119	0.069	0.164



reordering

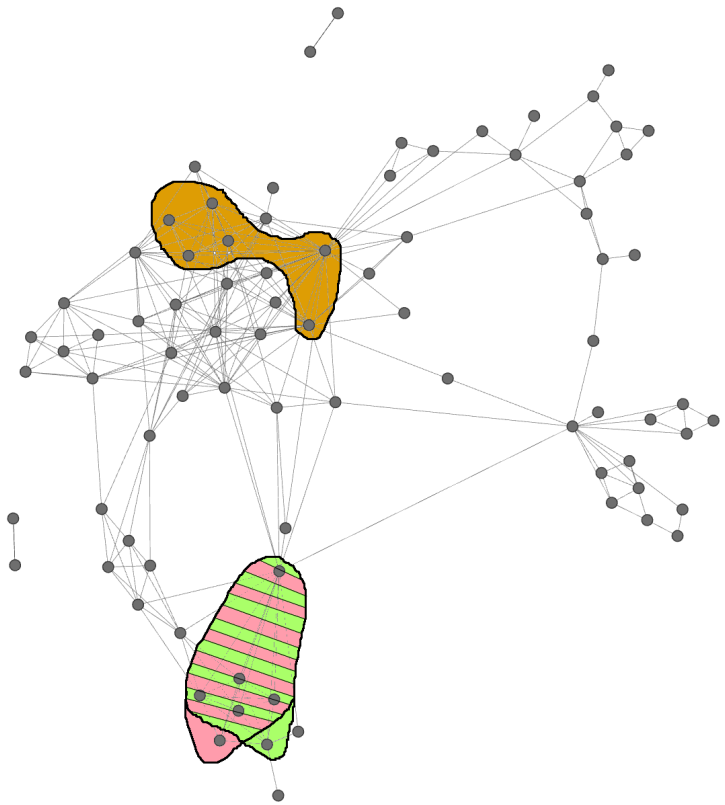
$\Rightarrow$



Community detection

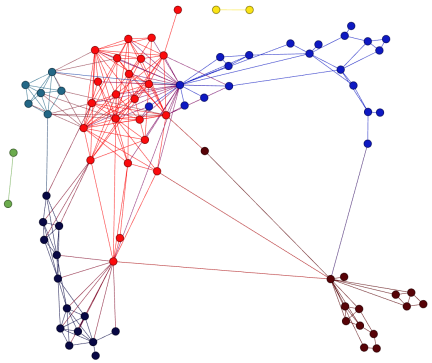
Clique search

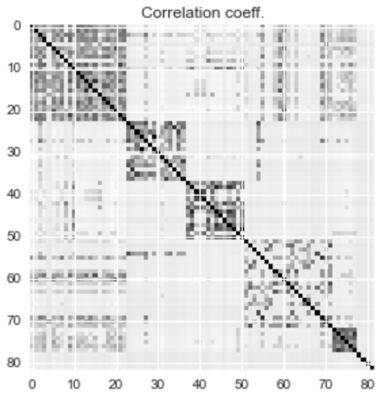
Maximal Clique size	2	3	4	5	6
Count	20	18	32	35	3



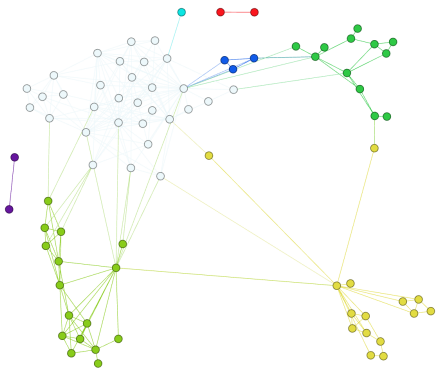
6-cliques

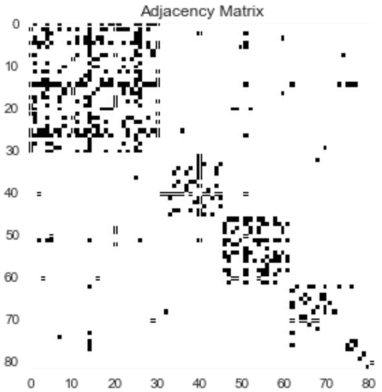
Greedy optimization of modularity

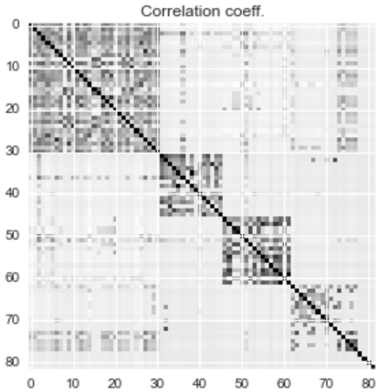




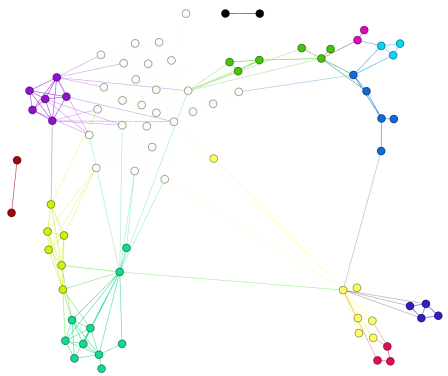
Community structure based on the betweenness of the edges

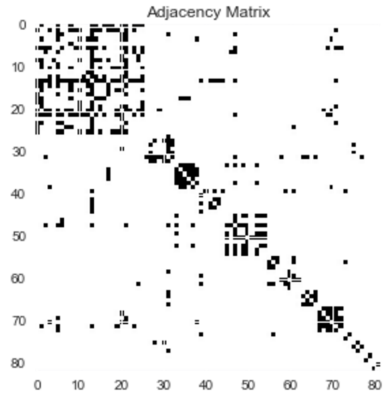


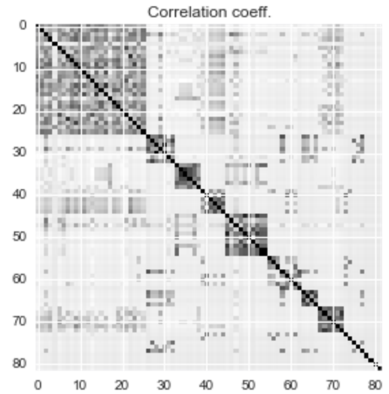




Community detection algorithm of Latapy & Pons, based on random walks







Multilevel spectral recursive partitioning algorithm