Social Network Analysis

Network science
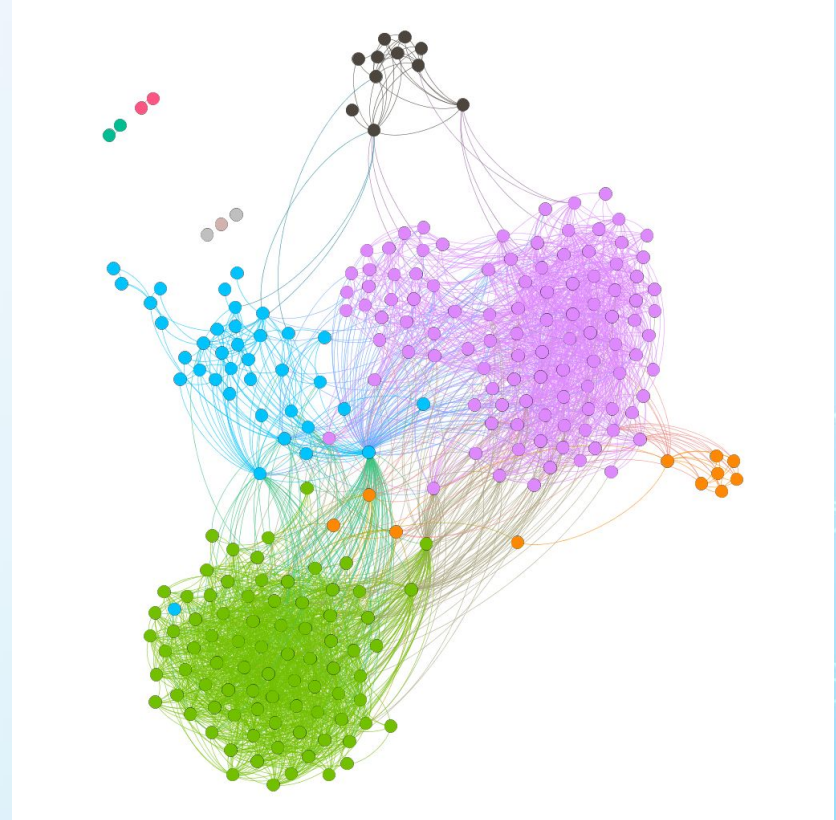
MIPT, 2020

Author *Sikalov Nikita*

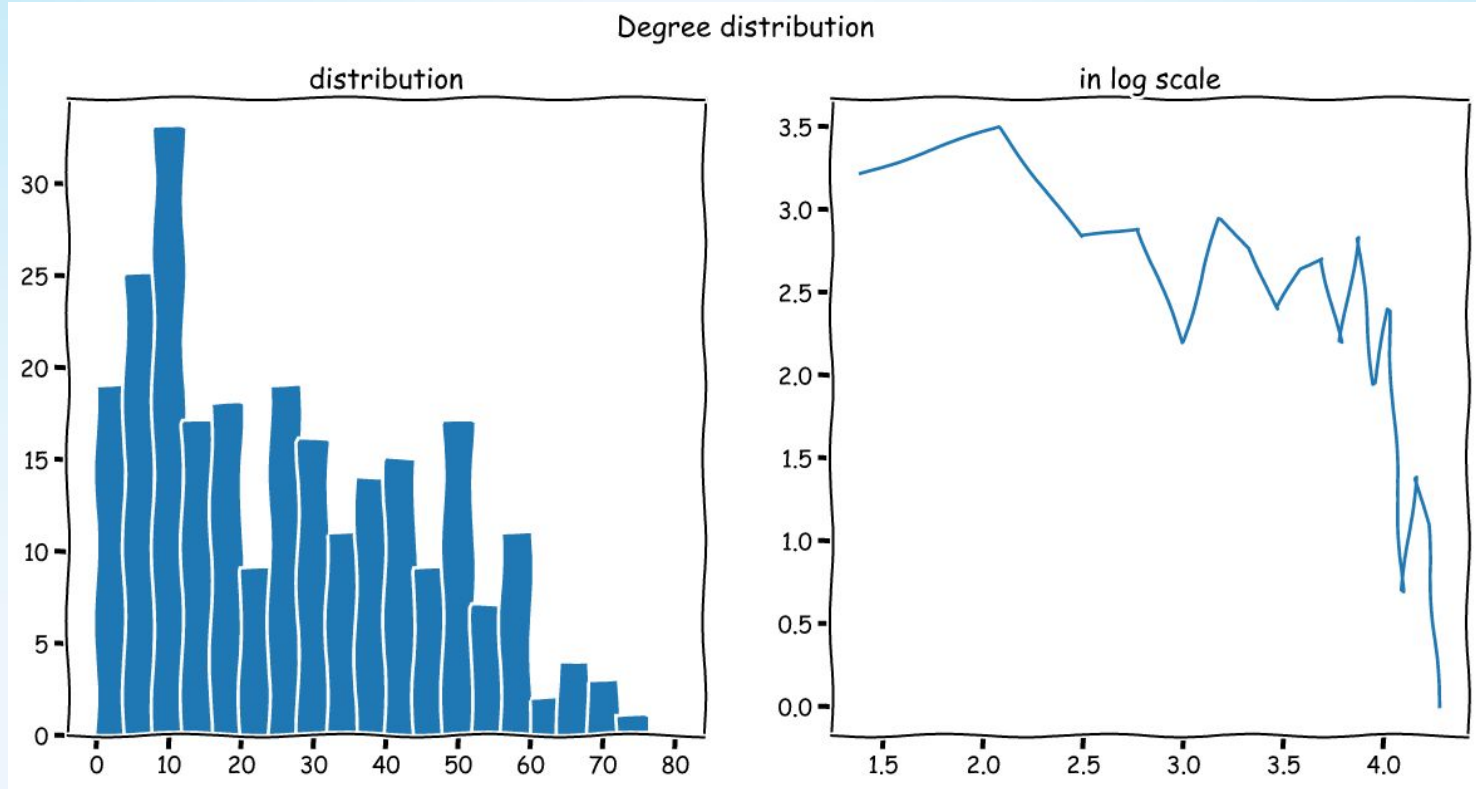# Network summary

Friends Network overview from VK social net

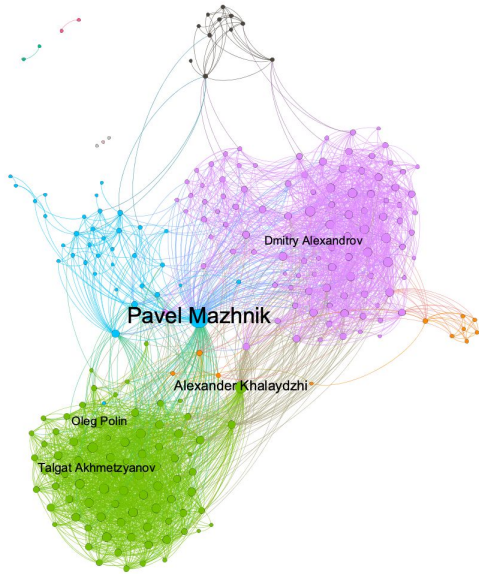| Metric name	Value
Size	3425
Order	252
Diameter	5
Average path	2.28
Clustering coefficient	0.57
Density	0.11

Power law

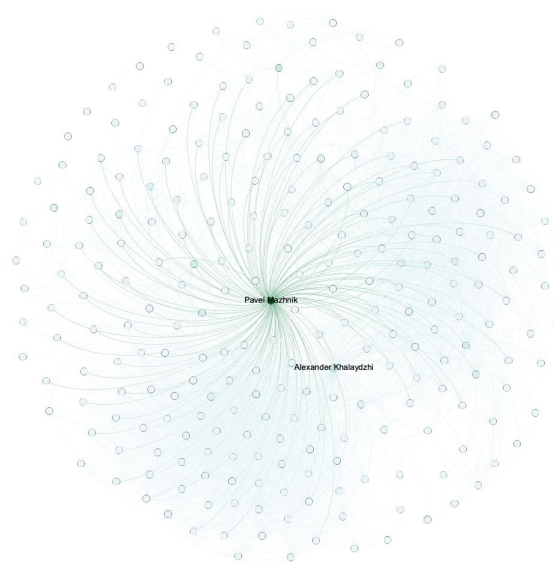Obtained friends network doesn't satisfy power law
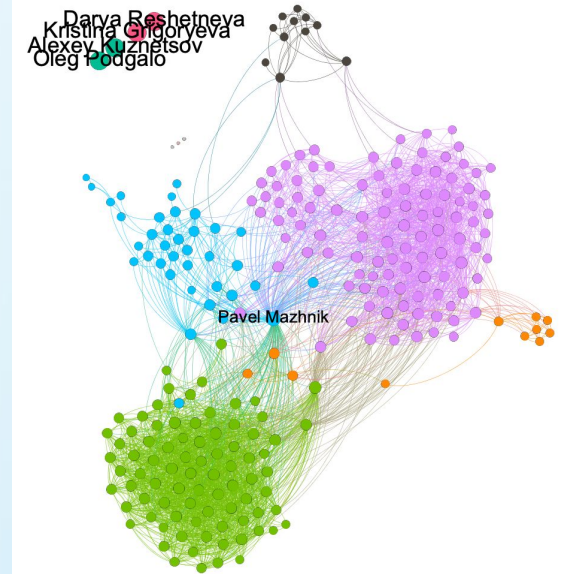degrees distribution

Centralities

Comparing main centralities metrics and its visualization
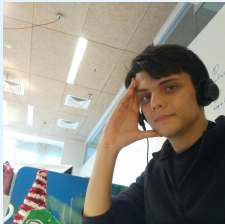

Degree centrality
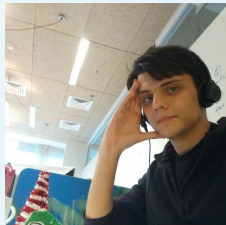
Betweenness centrality

Closeness centrality

Top people in network

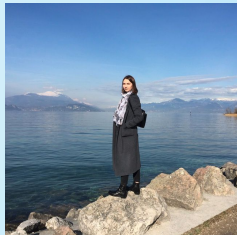| Degree	Betweenness	Closeness
Pavel Mazhnik (159) *Old friend from middle school and hometown*	**Pavel Mazhnik (0.332)** *Old friend from middle school and hometown*	**Kristina Grigoryeva (1.0)** *Friend from work (in small connected c.)*
Alexander Khalaydzhi (87) *Friend from olphys family and physics competitions*	**Alexander Khalaydzhi (0.053)** *Friend from olphys family and physics competitions*	**Darya Reshetneva (1.0)** *Friend from work (in small connected component)*
Talgat Akhmetzyanov (74) *University friend and roommate*	**Andrey Golman (0.031)** *Friend from math's schools and competitions*	**Alexey Kuznetsov (1.0)** *Friend from sport (in small connected component)*

Page rank

Pavel Mazhnik (0.023)
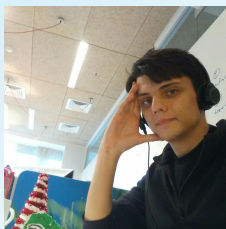*Old friend from middle school and hometown*

Ilya Lukyanov (0.009)
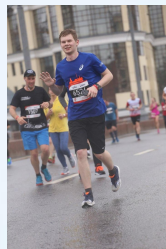*Physics teacher and manager in Olphys family*

Alexander Khalaydzhi (0.010)
Friend from olphys family and physics competitions

Andrey Golman (0.009)
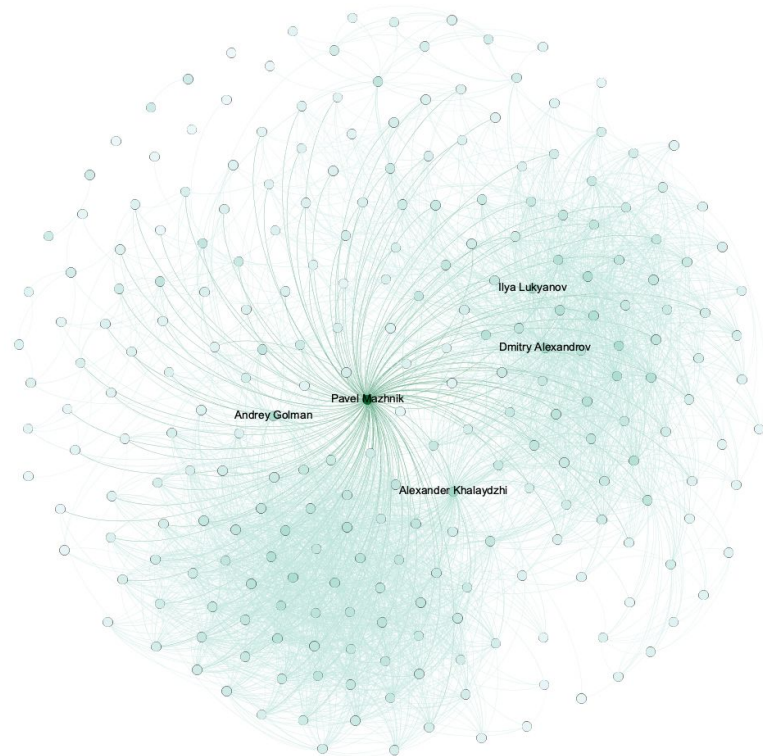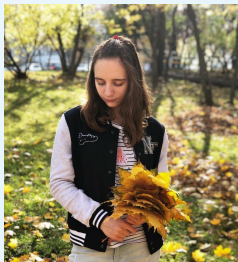*Friend from math's schools and competitions*

Dmitry Alexandrov (0.009)
Physics teacher (Olphys family)
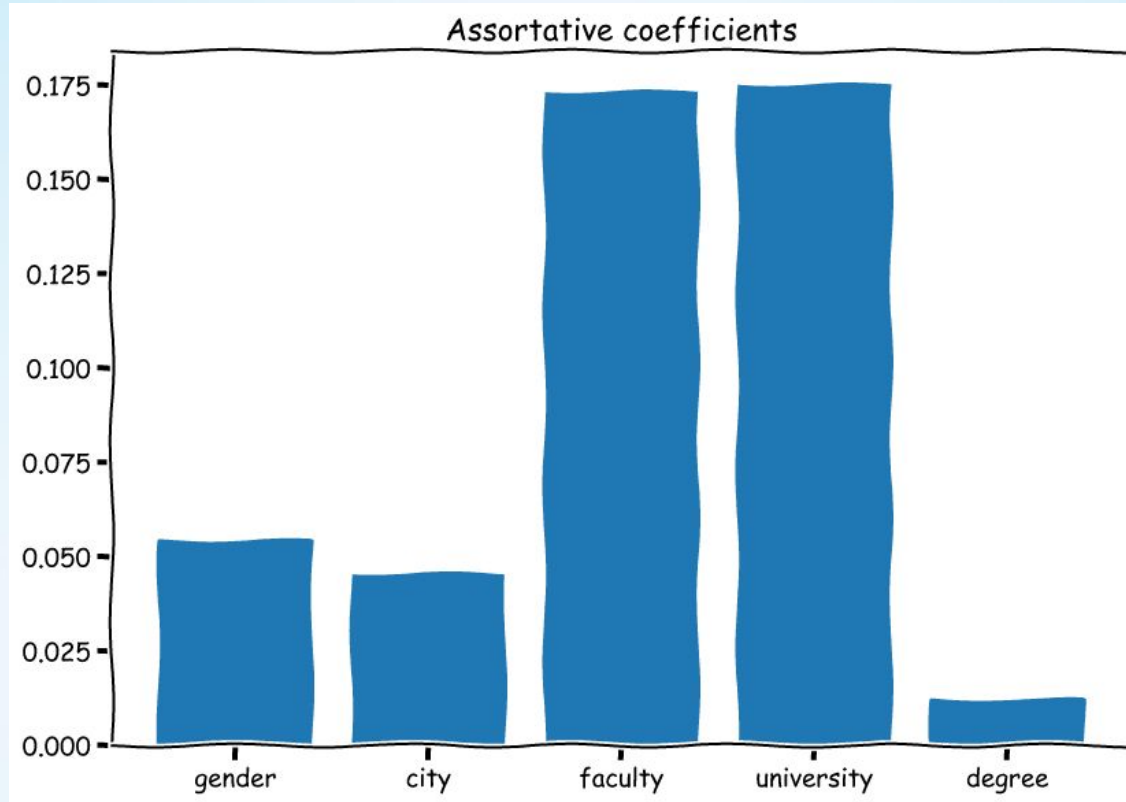
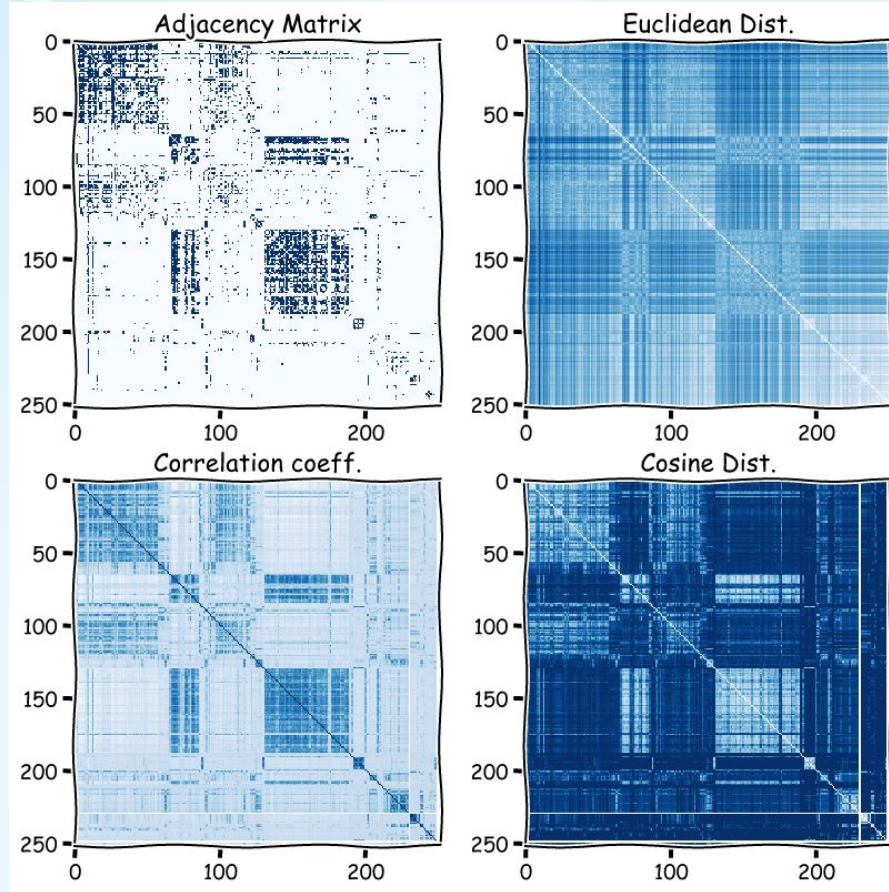**Alexandra Sokolova (0.008)**
Friend from olphys family

Top people with high page rank

Assortative mixing

Comparing assortative mixing coefficients according to different node's attributes

Node structural equivalence

Random networks models

Comparing with different random networks models

Metric name	My friends network	Watz and Strogatz network	Barabasi and Albert network	Erdos and Renyi network
Size	3425	3276	3555	3425
Order	252	252	252	252
Density	0.108	0.104	0.112	0.108
Clustering c.	0.570	0.164	0.207	0.109
Avg path	2.280	1.983	1.945	1.939
Diameter	5	3	3	3

Random networks models

Comparing degree distribution of networks
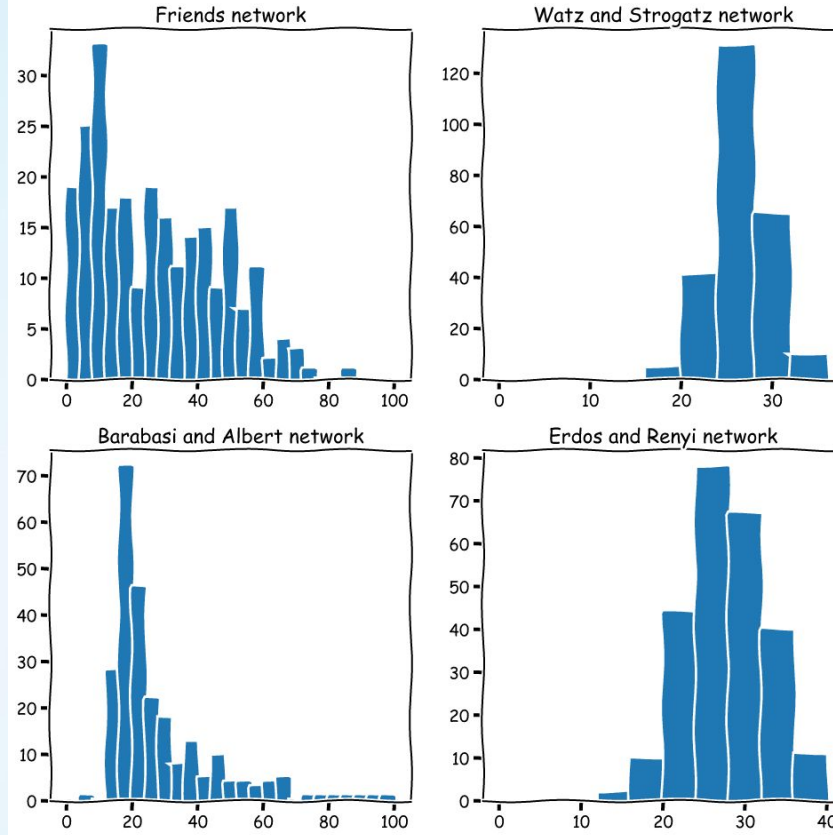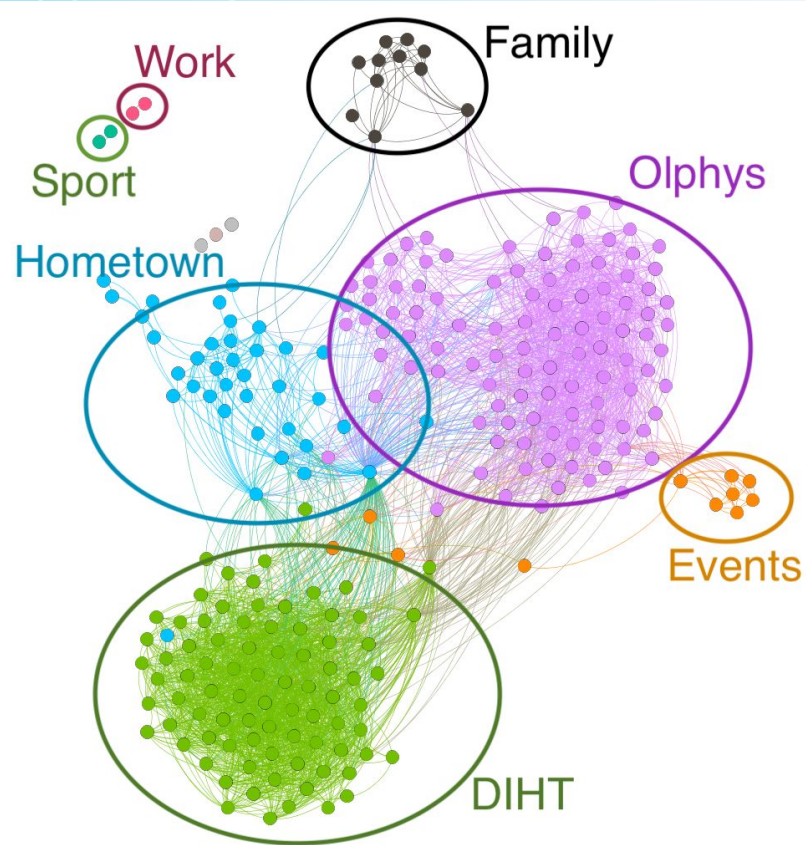
Cliques search

Maximal clique size = **19**

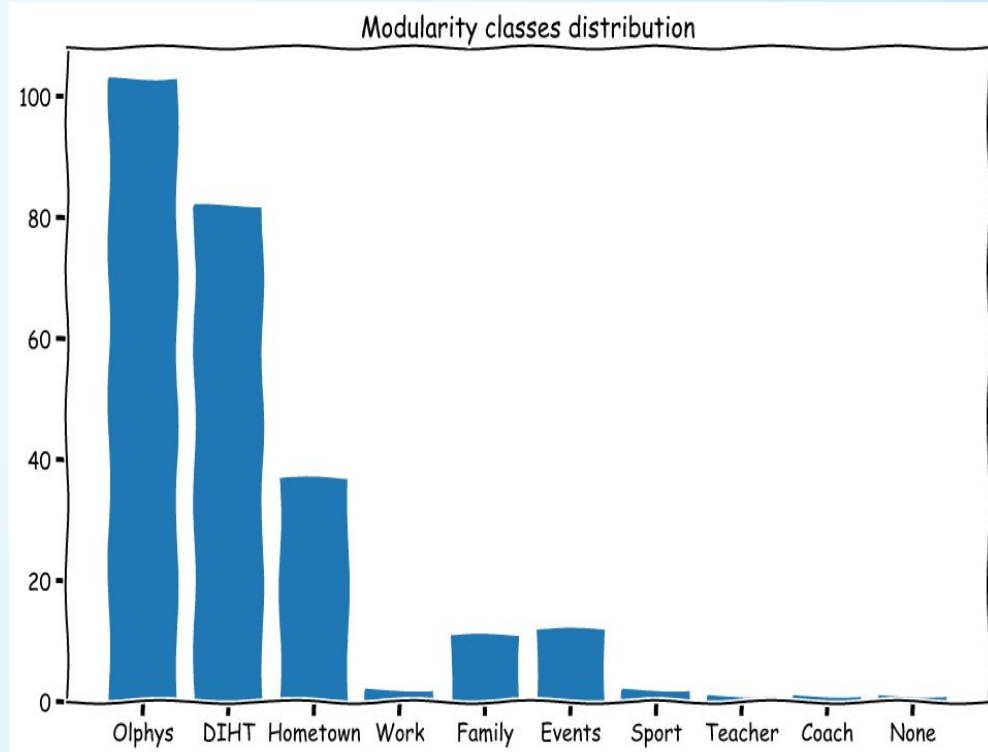*Count of maximal cliques* = **19**

All maximal cliques consist of MIPT **students** of **Department Innovations and high technologies**
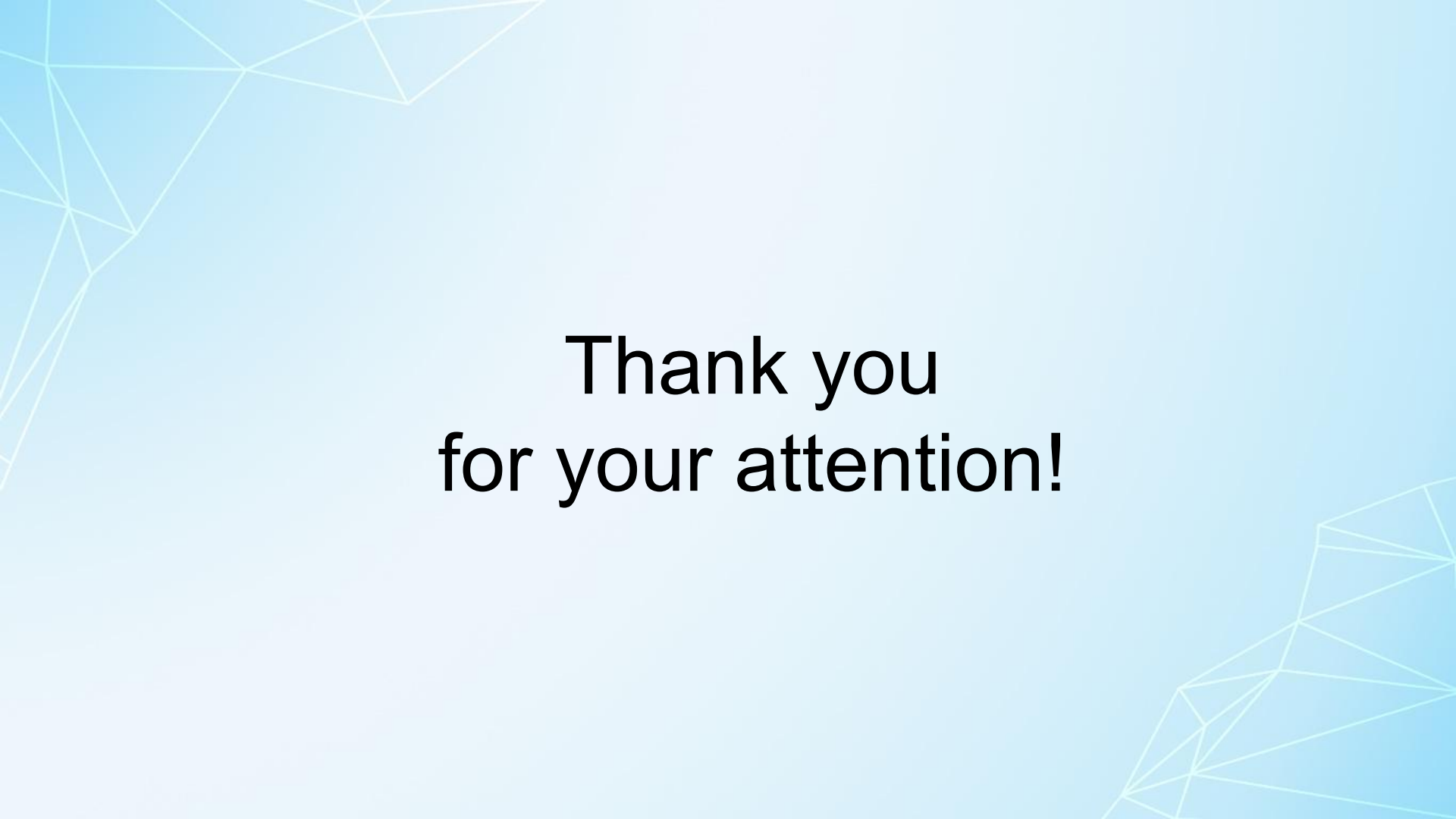
Communities

Modularity coef. = **0.467**

Thank you
for your attention!