Analysis of Community Structures and User Interactions in the Facebook Social Graph

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Preliminary part

The purpose of the project is gain detailed insights into how users form communities and interact within these groups on Facebook

Check-list

❌ 1. Project repository inside https://github.com/SNA-23

✅ 2. Project communication channel

Link: https://t.me/+hdVSeLnWr-IyZTYy

✅ 3. Project members

Daria Zabelina, Artyom Gotovtsev

✅ 6. Roles in team

Each member is responsible for various aspects of data preprocessing, analysis and visualization to ensure comprehensive research outcomes

Preliminary part

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Check-list

✅ 4. Key idea and description of the project

The project titled "Analysis of Community Structures and User Interactions in the Facebook Social Graph" aims to explore how users form groups and interact within these communities on Facebook. The primary objective is to analyze and understand the complex networks of user connections on Facebook to enhance scientific knowledge and offer practical applications for improving user engagement and community management on social media platforms

✅ 5. The goal of the project and steps to reach the goal

The goal of the project is to gain detailed insights into how users form communities and interact within these groups on Facebook

To achieve this goal, the following **objectives** were set:

– **to construct a social graph** with nodes representing users and edges showing their interactions
– to use **advanced community detection algorithms** to identify different user groups
– to conduct **centrality analysis** to find key influencers in the network
– **to analyze interactions** to understand the roles and influence of different users
– to **visualize the network** using tools like Gephi or NetworkX

Current state of the work

The purpose of the project is gain detailed insights into how users form communities and interact within these groups on Facebook

Check-list

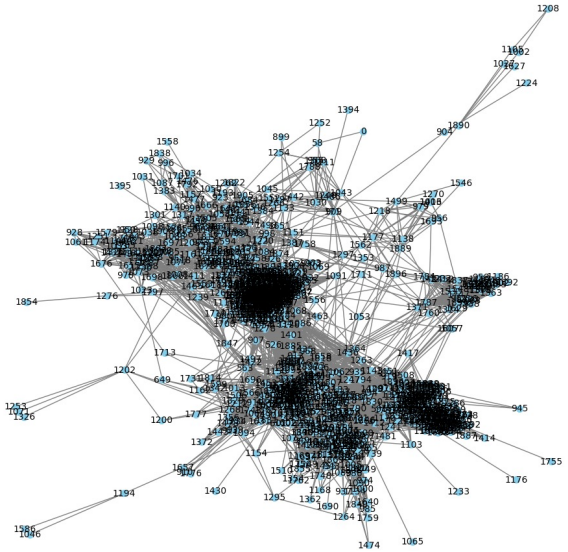
✅ 7a. Description of the research dataset

The research utilizes a dataset downloaded from the Stanford Network Analysis Project (SNAP)[1], specifically from the "Social circles: Facebook" dataset. The dataset, extracted from a file named "facebook.tar.gz," includes:

- “**edges**” files containing edges for each node's ego network
- “**circles**”, files containing circle information for each node's ego network
- “**feat**” and .”**egofeat**”, files containing feature information for nodes in the edge files and ego nodes, respectively
- “**featnames**”, files listing the names of each feature dimension

✅ 7b. Network design and framing

The network design involves constructing graphs where nodes represent individual users and edges denote interactions between them. Using NetworkX, nodes are automatically managed based on the edges defined in the .edges files for each ego network



✅ 7c. Network description (were computed)

Centrality measures have been computed to understand the importance and influence of nodes within the network

The network diameter, representing the longest shortest path between any two nodes, varies across ego networks

Network density, indicating the proportion of possible connections that are actual connections

1 – Social circles: Facebook. [Electronic resource] URL: https://snap.stanford.edu/data/ego-Facebook.html (access date 14/05/2024)